

MICROCOPY RESOLUTION HEST CHART



INSTALLATION RESTORATION PROGRAM PHASE II (Stage 2-1)

Volume 2 Final

McClellan AFB California
Air Force Logistics Command
Headquarters Air Force Logistics Command
Wright-Patterson AFB, OH

May 1985

Prepared By:

Radian Corporation Contract No.-F33615-83-D-4001, Order 16

USAF OEHL Monitor - Captain Robert W. Bauer Technical Services Division (TS)

Prepared For:

United States Air Force
Occupational and Environmental Health Laboratory (OEHL)
Brooks Air Force Base, Texas 78235



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^{*}Appendices 6, 8, 10, 11 and 13 contain no data. They are included only to maintain the numeric correlation with Phase II-Stage 2-1 task numbers for ease of cross-referencing.

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^{*}Appendices 6, 8, 10, 11, and 13 contain no data. They are included only to maintain the numeric correlation with Phase II-Stage 2-1 task numbers for ease of cross-referencing.



APPENDIX 1

This appendix provides information regarding Task 1, as discussed in text Section 3.1.

Appendix Contents

1-A Examples of Database Forms

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INSTALLATION RESTORATION PROGRAM PHASE II (STAGE 2-1) McCLELLAN AFB, CALIFORNIA

	SITE SPECIFIC INFORMATION SUMMARY
GRID CELL:	$\frac{1}{X}$, $\frac{1}{Y}$ (X = 01 - 19, Y = 01 - 25)
COORDINATES:	X = (Feet East of Grid Origin)
	Y = (Feet North of Grid Origin
VARIABLES:	z ₁ = (Source of Information)
	Z ₂ = (Current Use)
	Z ₃ = (Contamination Status)
	$Z_4 = $ (Depth to Water)
	Z ₅ =(Elevation of Water)
	Z ₆ = (Top of Screened Interval - Elevation)
	Z ₇ = (Bottom of Screened Interval - Elevation)
	Z ₈ =(Number of Screened Zones)
	Z _q =(Highest TCE Concentration [ppb])
	Z ₁ = (Most Recent TCE Concentration [ppb])
	Z ₁₁ = (Land Surface Elevation)
	Z ₁₂ = (Highest 1,1 DCE Concentration [ppb])
	Z ₁₃ = (Most Recent 1,1 DCE Concentration [ppb])
	Z ₁₄ =(Highest 1,2 DCA Concentration (ppb])
	Z ₁₅ = (Most Recent 1,2 DCA Concentration [ppb])
INFORMATION:	(Summarize All Pertinent Information for This Location)
· - <u>-</u>	
Source(s):	
(Na	ame, Date, or "Well Inventory")

Figure 2.B-1. Site-Specific Information Form

INSTALLATION RESTORATION PROGRAM [] NEW PHASE II (STAGE 2-1)

McCLELLAN AFB, CA

[] UPDATE

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***************************************	=====	====	====	****	=====		2222	====	2 222 3	======	
GOURCE:											
INFORMATION TYPE:											
AREA OF INFORMATION:				TUDY							
	L 1										
INFORMATION:				-							
										MIRPI	I 2-1-03

INSTALLATION RESTORATION PROGRAM PHASE II (STAGE 2-1) McCLELLAN AFB, CA

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	BIBLIOGRAPHIC INFORMATION
***********	***************************************
AUTHOR(S):	
	1ST AUTHOR'S LAST NAME, INITIALS AND SUCCEEDING AUTHORS' INITIALS
	FOLLOWED BY LAST NAME,
PUBLICATION	YEAR: (E.G., 1984)
TITLE:	
PUBLICATION:	
	JOURNAL, OR PUBLISHING HOUSE AND CITY
VOLUME, NUME	BER: V, No (E.G., V.30, No.12)
PAGES:	(FOR ARTICLES USE INCLUSIVE PAGES pp)
	(FOR TEXT USE TOTAL PAGESp.)
COMMENTS:	
DATE REVIEWS	ED:
	DD-MM-YY
REVIEWER:	(INITIALS)
SOURCE:	

MIRPII 2-1-02



APPENDIX 2

This appendix provides information regarding Task 2, as discussed in text Section 3.2.

Appendix Contents

- 2-A Annotated Bibliography
- 2-B Methodolology for the Reduction of Information from Site-Specific File Sets to the Computer Database
- 2-C General Information for McClellan AFB Ground-Water Monitoring Wells

APPENDIX 2-A

Annotated Bibliography

FIRST AUTHOR: Arcade Water District

PUBLICATION YEAR: 1984

TITLE: Locations, Specifications, Geologic Logs, Water Quality and Production

Information for Arcade Water District Production Wells in Close Prox-

imity to the McClellan AFB Study Area

PAGES: 25 p.

SOURCE: Walter Libal, Arcade Water District, 13 June 1984

FIRST AUTHOR: Bachmat Y.and Others

PUBLICATION YEAR: 1980

TITLE: Groundwater Management: The Use of Numerical Models, Water

Resources Monograph 5

PUBLICATION: American Geophysical Union

PAGES: 178

SOURCE: Radian Library

COMMENTS: Describes numerous ground-water modeling codes

FIRST AUTHOR: Bahner, L. H.

PUBLICATION YEAR: 1984

TITLE: Memorandum to Jocob Sprouse, General Accounting Office, describing comments to the Phase II McClellan Report as developed by the staff

of the USEPA Solid Waste Emergency and Remedial Response and Waste

Programs Enforcement

PAGES: 3 p.

SOURCE:: Obtained from the USAF for the project proposal effort

FIRST AUTHOR: Barcelona, M. J.

OTHER AUTHORS: J. P. Gibb and R. A. Miller

PUBLICATION YEAR: 1983

TITLE: A Guide to the Selection of Materials for Monitoring Well Construc-

tion and Ground-Water Sampling

PUBLICATION: Illinois State Water Survey Contract Report 327, Champaign, IL

PAGES: 78

SOURCE: Radian Library

COMMENTS: Current, comprehensive monograph on subject

FIRST AUTHOR: Barcelona, M. J.

OTHER AUTHORS: J. A. Helfrich, E. E. Garske and J. P. Gibb

PUBLICATION YEAR: 1984

TITLE: A Laboratory Evaluation of Ground-water Sampling Mechanisms

PUBLICATION: Ground-water Monitoring Review

VOLUME, NUMBER: V. 4 No. 2

PAGES: 32-41

SOURCE: Radian Library Journal

COMMENTS: Rigorous test of reliability, bias of sampling equipment and

procedures

FIRST AUTHOR: Bayer, J. E.

PUBLICATION YEAR: 1983 MONTH: September DATE: 30

TITLE: Letter to Col. Russell HQ AFLC/SGB describing additional material on

Installation Restoration Program, Phase II, McClellan AFB in response

to CRWQB, Central Valley Region request

PAGES: 31 p.

SOURCE: Obtained from USAF for the project proposal effort

COMMENTS: Responses developed by Engineering-Science. Some important data,

good description of drilling practices.

FIRST AUTHOR: Brunner, P. G. and OTHER AUTHORS: J. S. Zipfel

PUBLICATION YEAR: 1981 MONTH: April DATE: 30

TITLE: Final Report for Investigating Ground-water Contamination as of 30

April 1981

PUBLICATION: USAF Technical Report

VOLUME, NUMBER: V.1 No. 1

PAGES: 300

SOURCE: Obtained from the USAF for the project proposal effort

COMMENTS: This report describes the results of pre-Phase II ground-water

investigations conducted by McClellan AFB. The report describes the results of monitor well installation and sampling activities

and soil sampling efforts.

FIRST AUTHOR: California Department of Water Resources

PUBLICATION YEAR: 1984

TITLE: Ground-Water Contour Maps from 1950s thru Early 1980s for the

McClellan AFB Area.

PUBLICATION: Unpublished

PAGES: 10

SOURCE: Grant Ardell, California Department of Water Resources

FIRST AUTHOR: California Department of Water Resources

PUBLICATION YEAR: 1974 MONTH: July

TITLE: Evaluation of Ground-water Resources: Sacramento County

PUBLICATION: California Department of Water Resources Bulletin No. 118-3

PAGES: 141

SOURCE: John R. Feldon, California Department of Water Resources

COMMENTS: Contains hydrogeologic information for shallow and deep aquifers

in Sacramento County California. The report details general water quality and aquifer characteristics for the McClellan AFB

area.

FIRST AUTHOR: California Department of Water Resources, Central Region

PUBLICATION YEAR: 1984

TITLE: California Department of Water Resources Drillers' Files

PAGES: 400

SOURCE: Grant Ardell, CDWR, Central Region, 23 May 1984

COMMENTS: This file contains construction, testing and geologic logs for

off-base wells which lie within the study area. These logs are a subset of those obtained from John Tomko of the CWQCB,CVR 21 May

1984.

FIRST AUTHOR: California Department of Water Resources

PUBLICATION YEAR: August, 1978

TITLE: Evaluation of Ground-water Resources

PUBLICATION: Bulletin 118-6

PAGES: 135

COMMENTS: Report describes the hydrogeology of the Sacramento Valley.

Provides general hydrogeologic information for the study area.

FIRST AUTHOR: California Department of Water Resources, Central Region

TITLE: Southwest Area Well Survey File

PAGES: 100

SOURCE: Grant Ardell, CDWR, Central Region, 23 May 1984

COMMENTS: This file contains location maps and descriptions of wells

located in the southwest area survey. Some very good inventory

data in this file.

FIRST AUTHOR: California Department of Water Resources TITLE: Water Well Drillers' Reports for Off-Base Wells

PAGES: 1500

SOURCE: John Tomko, CRWQB, CVR 21 May 1984

COMMENTS: Water well drillers' reports for wells within and just outside

the area of interest. According to John Tomko of CRWQB, CVR these logs were compiled February, 1984. Because of the lack of significant economic activity in the area, additional wells installed since then should be very few. File considered as back-

up to California Department of Water Resources Files.

FIRST AUTHOR: California Division of Mines of Geology

PUBLICATION YEAR: 1984
TITLE: California Geology

PUBLICATION: California Division of Mines and Geology

PAGES: 209

SOURCE: Radian Library

COMMENTS: This article provides an overview of the dual- tube air rotary

drilling method.

FIRST AUTHOR: California Division of Mines and Geology

PUBLICATION YEAR: 1966

TITLE: Mineral Resources of California

PUBLICATION: California Division of Mines and Geology Bulletin 191

PAGES: 450 p.

SOURCE: Radian Library

COMMENTS: Contains a general description of the geology of the Great

Valley geomorphic province boundaries.

FIRST AUTHOR: California Regional Water Quality Control Board

OTHER AUTHORS: Central Valley Region

TITLE: File Containing Water Quality Summaries for Off-Base Wells and Pre-

liminary Summary of Analytical Findings for the Off-Base Sampling

Program.

PAGES: 20 p.

SOURCE: John Tomko; CRWQB, CVR

FIRST AUTHOR: California Regional Water Quality Control Board

OTHER AUTHORS: Central Valley Region

TITLE: File of Letters to Off-Base Well Owners Describing Water Quality

PAGES: 110

SOURCE: John Tomko; CRWQB, CVR, 21 May 1984

COMMENTS: File contains letters to well owners listing analytical results

and explaining meaning. Also includes recent (1984) analytical

results.

FIRST AUTHOR: California Regional Water Quality Control Board

OTHER AUTHORS: Central Valley Region

TITLE: File on General Information for the Quarterly Sampling Effort (Off-

Base) and 1st thru 2nd Quarter Results for NW (J-M), Central, and

SW Sectors

SOURCE: John Tomko, CRWQB, CVR, 21 May 1984

COMMENTS: Analytical results and general information on quarterly sampling;

NW sector, 1st quarter results (Oct-Dec 1983); central sector;

2nd quarter results (Jan-March 1984)

FIRST AUTHOR: California Regional Water Quality Control Board

OTHER AUTHORS: Central Valley Region

PUBLICATION YEAR: 1984

TITLE: McClellan AFB Off-Base Water Quality File Set 1/3 - 3/3

PAGES: 875 p.

SOURCE: John Tomko, CRWQB, CRV; 21 May 1984

COMMENTS: This file set contains analytical data for off-base sampling

and analysis program through April, 1984

FIRST AUTHOR: CH2M Hill

PUBLICATION YEAR: 1981 MONTH: July

TITLE: Installation Restoration Program Records Search for McClellan Air

Force Base, California

PUBLICATION: Report to Air Force Engineering and Services Center

VOLUME, NUMBER: V. 1 No. 1

PAGES: 300

SOURCE: Obtained from the Air Force for the project proposal effort.

COMMENTS: This report presents the results of the Phase I Investigation for

McClellan AFB. Former waste disposal sites are described and characterized (ranked) in this report. The environmental setting

of the Base is also discussed,

FIRST AUTHOR: CH2M Hill

PUBLICATION YEAR: 1984b MONTH: March

TITLE: Installation Restoration Program Phase III/IV Area D Site

Characterization Study; Technical memorandum No. 2 for McClellan

Air Force Base, CA

PUBLICATION: Report to Air Force Engineering and Services Center Director-

age of Environmental Planning

VOLUME, NUMBER: V. 2 No. 1

PAGES: 500

SOURCE: Received from Lt. Col. Myers, May 21, 1984 during Radian-USAF

meeting

COMMENT: This report describes the results of an extensive waste/soil

boring and sampling program for the characterization of Area D.

FIRST AUTHOR: CH2M Hill

PUBLICATION YEAR: 1984c MONTH: May DATE: 9

TITLE: Installation Restoration Program, Phase III/IV Site Characterization

Study, Technical Memorandum No. 3, On-Base Drilling Program and

Hydrogeological Evaluation of Area "D"

PUBLICATION: Report to Air Force Engineering and Services Center

PAGES: 500

SOURCE: USAF, Lt. Col. Myers, May 21, 1984

COMMENTS: This report includes discussion on the results and findings for

or installation, testing and sampling of post Phase II monitoring

wells in Area "D".

FIRST AUTHOR: CH2M Hill

PUBLICATION YEAR: 1984d MONTH: May

TITLE: Draft Source Control Feasibility for Area D, McClellan Air Force

Base, Sacramento, California

PUBLICATION: Report to Air Force Engineering and Services Center

VOLUME, NUMBER: V.1 No. 1

PAGES: 300

SOURCE: USAF, Lt. Col. Myers, May 21, 1984

COMMENTS: This report presents the results of the Evaluation of Numerous

Potential Remedial Actions for Area "D".

FIRST AUTHOR: CH2M Hill PUBLICATION YEAR: 1984e

TITLE: Technical Memorandum: Hydrogeologic Conditions in the Vicinity of

Area D, McClellan Air Force Base

PUBLICATION: Technical Memorandum to CES/DEEP

PAGES: 12

SOURCE: Received from Capt. Mario Ierarti, 25 May 1984 during base visit COMMENTS: This report presents the results of a hydrogeologic analysis for Area D. Local historical ground-water flow directions and

velocities are considered.

FIRST AUTHOR: City of Sacramento

PUBLICATION YEAR: 1984

TITLE: Construction and Location Information for City of Sacramento Production Wells in Close Proximity to and within the McClellan AFB Study Area

PAGES: 25 p.

SOURCE: Lee Harry, City of Sacramento

COMMENTS: This file contains location and construction information for City of Sacramento production wells in close proximity to and

within the McClellan AFB study area.

FIRST AUTHOR: City of Sacramento

PUBLICATION YEAR: 1984

TITLE: Locations, Specifications, Geologic Logs, Water Quality and Production Information for City of Sacramento District Production Wells in Close Proximity to the McClellan AFB Study Area

PAGES: 20 p.

SOURCE: Duane Malme, City of Sacramento, 13 June 1984

FIRST AUTHOR: County of Sacramento, Tax Assessor's Office

TITLE: Tax Assessor's Maps of Area of Interest Near McClellan AFB

PAGES: 100

SOURCE: John Tomko, CRWQB, CVR; 21 May 1984 and Sacramento County Tax

Assessor's Office.

COMMENTS: Set of maps describing (showing) block, section and parcel

property divisions in the area of McClellan AFB.

FIRST AUTHOR: Crooks, W. H.

PUBLICATION YEAR: 1984 MONTH: August DATE: 24

TITLE: Letter to General Trevor A. Hammond from William H. Crooks

(CVRWQB,CVR) describing comments to the Phase II IRP Report for

McClellan AFB

PAGES: 13 p.

SOURCE: Obtained from the USAF for the project proposal effort

FIRST AUTHOR: Curran, C. M. OTHER AUTHORS: M. B. Tomson PUBLICATION YEAR: 1983

TITLE: Leaching of Trace Organics into Water from Five Common Plastics

PUBLICATION: Ground Water Monitoring Review

VOLUME, NUMBER: V. 3 No. 3

PAGES: pp. 68-71

SOURCE: Radian Library Journal

COMMENTS: Direct laboratory determination of contaminant release from plas-

tics used for casing and transfer tubing.

FIRST AUTHOR: Davis, S. N. and R. J. M. DeWiest

PUBLICATION YEAR: 1966 TITLE: Hydrogeology

PUBLICATION: John Wiley & Sons Inc., Inc.

PAGES: 463

SOURCE: Radian Library

COMMENTS: General Text Describing Hydrogeologic Processes and Methods of

Study

FIRST AUTHOR: DEEE Surveyors

PUBLICATION YEAR: 1982 MONTH: September DATE: 2

TITLE: Ground Surface Elevations for McClellan AFB Monitor Wells (On-Base)

PUBLICATION: Letter to Paul G. Brunner from DEEE Surveyors

PAGES: 2 p.

SOURCE: Received from Capt. Mario Ierarti, 25 May 1984 during base visit.

COMMENTS: Ground surface elevations for on-base monitor wells.

FIRST AUTHOR: Dolegowski, J.

PUBLICATION YEAR: 1984 MONTH: September DATE: 11

TITLE: Personal Conversation with John Dolegowski CH2M Hill, Redding CA,

September 11, 1984

SOURCE: Elevation data for Base Monitoring Wells 51 through 57. Data also

provided for "roofing company wells."

FIRST AUTHOR: Durbin, T. J. & C. Berenbrock

PUBLICATION YEAR: 1984

TITLE: Three Dimensional Simulation of Free Surface Aquifers by the Finite

Difference Method

PUBLICATION: USGS Water Study Paper SOURCE: United States Geological Survey

FIRST AUTHOR: Ellsworth, A. L.

PUBLICATION YEAR:

TITLE: Letter to Brig. General Trevor A. Hammond describing CDOHS responses

to Phase II Report, McClellan AFB

PUBLICATION: 1983 MONTH: August DATE: 17

PAGES: 1 p.

SOURCE: Obtained from USAF for the project proposal effort.

FIRST AUTHOR: Engineering-Science and USAF

PUBLICATION YEAR: 1984

TITLE: Water Level Data for Base Monitor Wells

PAGES: 50 p.

SOURCE: Lt. Col. Milo C. Myers, 12 June 1984

COMMENTS: This file was developed by the USAF and its consultant,

Engineering-Science. The file set contains records of periodic water level measurements for on-base monitor wells at McClellan

AFB.

FIRST AUTHOR: Engineering-Science
PUBLICATION YEAR: 1983 MONTH: June

TITLE: Final Report: Installation Restoration Program Phase II - Confirma-

tion; McClellan AFB, California

PUBLICATION: Report to USAF Occupational and Environmental Health

Laboratory, Brooks AFB, Texas

VOLUME, NUMBER: V. 1 & 2

PAGES: 500

SOURCE: Obtained from the USAF for the project proposal effort

COMMENTS: Report describes the findings of the Phase 2 investigation,

including monitor well installation and sampling

FIRST AUTHOR: EPA, Environmental Monitoring Support Laboratory

PUBLICATION YEAR: 1979

TITLE: Handbook for Analytical Quality Control in Water and Wastewater

Laboratories

PUBLICATION: EPA-600/4-79-019, EMSL, Cincinnati, OH

SOURCE: Radian Library

COMMENTS: Contains detailed guidance on sampling for trace-level organics,

field quality assurance, chain-of-custody and record-keeping.

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FIRST AUTHOR: Fenn, D.

OTHER AUTHORS: E. Cocozza, J. Isbister, O. Braids, B. Yare and P. Roux

PUBLICATION YEAR: 1977

TITLE: Procedures Manual for Ground Water Monitoring at Solid Waste

Disposal Facilities

PUBLICATION: U. S. EPA, Office of Solid Waste, Manual SW-616, also cited

elsewhere as EPA/530/SW611

PAGES: 269

SOURCE: Radian Library

COMMENTS: General, step-by-step guide for designing and implementing

ground-water monitoring programs.

FIRST AUTHOR: Freeze, R.A. and OTHER AUTHORS: J. A. Cherry

PUBLICATION YEAR: 1979 TITLE: Groundwater

PUBLICATION: Prentice-Hall, Inc., Englewood Cliffs, NJ

PAGES: 604

SOURCE: Radian Library

COMMENTS: General text on ground-water flow and chemistry. Referenced

alpha diagram of carbonate anion stabilities - page 99.

FIRST AUTHOR: Humenick, M. J.

OTHER AUTHORS: L. J. Turk and M. P. Colchin

PUBLICATION YEAR: 1978

TITLE: Sampling of Ground-water, Baseline and Monitoring Data for In-Situ

Processes

PUBLICATION: Technical Report (CRWR-157/EHE 78-01), Center for Research in

Water Resources, The University of Texas at Austin, Austin,

Texas

PAGES: 128

SOURCE: Radian Library

COMMENTS: Describes and validates methods of calibrating monitor wells by

measuring field parameters in pump discharge to determine optimum

time to pump before sampling.

FIRST AUTHOR: Ierarti, M.

PUBLICATION YEAR: 1984 MONTH: May DATE: 25 TITLE: Current Status of On-Base Production Wells

PAGES: 1 p.

SOURCE: Received from Capt. Mario Ierarti, 25 May 1984 during base visit. COMMENTS: Information pertaining to the current operation status (active,

inactive, etc.) of the McClellan AFB production wells.

FIRST AUTHOR: International Ground Water Modeling Center (IGWMC)

PUBLICATION: 1981

TITLE: Ground-water Models which are Documented and Available PUBLICATION: Holcombe Research Institute, Indianapolis, Indiana

PAGES: 75

COMMENTS: Describes general features of numerous ground-water modeling

codes.

FIRST AUTHOR: Kincaid, C. T. and J. R. Morrey and J. E. Rogers

PUBLICATION YEAR: 1984

TITLE: Geohydrochemical Models for Solute Migration Volume 1: Process

Description and Computer Code Selection

PUBLICATION: Electric Power Research Institute, Palo Alto, California

PAGES: 200

COMMENTS: Describes numerous ground-water and geochemical modeling codes.

FIRST AUTHOR: Konikow L. F. and J. D. Bredehoeft

PUBLICATION YEAR: 1984

TITLE: Computer Model of Two-Dimensional Solute Transport and Dispersion in

Ground Water

PUBLICATION: USGS Water Resource Investigations, Chapter C2, Book 7

PAGES: 90

SOURCE: Radian Library

COMMENTS: Describes the USGS-MOC ground-water modeling code and its

application.

FIRST AUTHOR: Landis, T.

PUBLICATION YEAR: 1983 MONTH: July DATE: 27

TITLE: Internal CDHS Memorandum describing comments to the McClellan

Phase II Report

PAGES: 16 p.

SOURCE: Obtained from the USAF for the project proposal effort.

FIRST AUTHOR: Lischeske, C. and

OTHER AUTHORS: D. Spath

PUBLICATION YEAR: 1983 MONTH: September DATE: 7

TITLE: McClellan AFB Groundwater Contamination Action Levels and MCL's PUBLICATION: List developed by DCOHS, Sanitary Engineering Branch

SOURCE: USAF, Lt. Col. Milo G. Myers, 21 May 1984

COMMENTS: This list identifies action or maximum contaminant levels for

various ground-water contaminants. Criteria for the various

standards are provided.

FIRST AUTHOR: Lischeske, Jr., C. R.

PUBLICATION YEAR: 1984 MONTH: May DATE: 21

TITLE: List of Wells Reported But Not Sampled by the California Department

of Health Services, Sanitary Engineering Branch

PUBLICATION: Technical Memorandum (unpublished)

PAGES: 1 p.

SOURCE: Carl Lischeske Jr. of California Department of Health Services

FIRST AUTHOR: Luhdorff and Scalmanini, Consulting Engineers

PUBLICATION YEAR: 1983 MONTH: December

TITLE: Base Well Sealing Report, McClellan Air Force Base, California

PUBLICATION: Preliminary Report to U. S. Air Force, McClellan Air Force Base

VOLUME, NUMBER: V1 No. 1

PAGES: 250

SOURCE: Obtained from USAF for the project proposal effort

COMMENTS: Report provides recommendations for grouting base production wells

to slow/eliminate vertical movement of contaminants.

FIRST AUTHOR: Miller, C. T. and OTHER AUTHORS: W. J. Weber, Jr.

PUBLICATION YEAR: 1984

TITLE: Modeling Organic Contaminant Partitioning in Ground-Water Systems

PUBLICATION: Ground Water "OLUME, NUMBER: V. 22, No. 5

AGES: 584-592

SOURCE: Radian Library

COMMENTS: Article describes mathematical models used to predict solute

matrix interactions.

FIRST AUTHOR: Morrison, R. D.

PUBLICATION YEAR: 1983

TITLE: Ground Water Monitoring Technology

PUBLICATION: Timco Mfg., Inc., Prairie du Sac, Wl

SOURCE: Radian Library

COMMENTS: Good, detailed discussions of procedures, equipment and

applications.

FIRST AUTHOR: Myers, M. G., Lt. Col.; Bioenvironmental Engineering

Services, McClellan AFB, CA

PUBLICATION YEAR: 1984

TITLE: Personal Communication with E. W. Pearce, Radian Corporation

PUBLICATION: 30 May 1984

COMMENTS: Response to letter of engineering, provided annual cost of USAF

technician for sampling effort; requesting that labor be mini-

mized in sample program design.

FIRST AUTHOR: Nacht, S. J. PUBLICATION YEAR: 1983

TITLE: Monitoring Sampling Protocol Considerations

PUBLICATION: Ground Water Monitoring Review

VOLUME, NUMBER: V. 3, No. 3

PAGES: 23-29

SOURCE: Radian Library Journal

COMMENTS: Review article

FIRST AUTHOR: Nordhav, Y.

PUBLICATION YEAR: 1983 MONTH: August DATE: 5

TITLE: Letter by Engineering-Science to Col. Milo G. Myers describing

additional information for the Phase II work performed for McClellan

AFB

PAGES: 2 p.

SOURCE: Obtained from USAF for the project proposal effort

FIRST AUTHOR: Norris, R. M. OTHER AUTHORS: R. W. Webb PUBLICATION YEAR: 1976

TITLE: Geology of California

PAGES: 363 p.

SOURCE: Radian Reference Library

COMMENTS: This text book contains physiographic, geographic, morphologic and geologic descriptions of the Central Valley of California.

The description of the Central Valley in this book is general in

nature and provides good background information.

FIRST AUTHOR: Northridge Water District

PUBLICATION YEAR: 1984

TITLE: Locations, Specifications, Geologic Logs, Water Quality and Production Information for Northridge Water District Production Wells

in Close Proximity to the McClellan AFB Study Area

PAGE3: 15 p.

SOURCE: Warren Jung, Northridge Water District, 13 June 1984

FIRST AUTHOR: Osiensky, J. L. and G. V. Winter, R. E. Williams

PUBLICATION YEAR: 1984

TITLE: Monitoring and Mathematical Modeling of Contaminated Ground-Water

Plumes in Fluvial Environments

PAGES: 299-306

SOURCE: Radian Library

COMMENTS: Article describes transport processes in fluvial deposits.

Treats practicality of modeling contaminant movement in variable

fluvial systems.

FIRST AUTHOR: Parsons, F.

OTHER AUTHORS: P. R. Wood and J. DeMarco PUBLICATION YEAR: 1984 MONTH: February

TITLE: Transformations of Tetrachloroethene and Trichloroethene in Micro-

cosms and Groundwater

PUBLICATION: American Water Well Association Journal

PAGES: 56-59

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SOURCE: Capt. Mario Ierarti, USAF McCellan AFB

COMMENTS: Describes study in which tetrachloroethane was found to BE bio-

transformed to trichloroethene (secondary) and chloroethene,

cis and trans - 1, 2 dichloroethene and dichloromethane (tertiary)

in saturated porous media.

FIRST AUTHOR: Prickett, T. A., T. G. Naymik and C. G. Lonnquist

PUBLICATION YEAR: 1981

TITLE: A "Random-Walk" Solute Transport Model for Selected Ground-water

Quality Evaluations.

PUBLICATION: Illinois State Water Survey, Bulletin 65

PAGES: 103

SOURCE: Radian Library

COMMENTS: Describes the TRANS ground-water modeling code and its

application.

FIRST AUTHOR: Quine, R. L. CH2M Hill

PUBLICATION YEAR: 1984e

TITLE: Supplement to Draft Technical Memorandum No. 2, Site

Characterization Study, Phase III/IV Area D

PAGES: 40

SOURCE: USAF Lt. Col. Milo G. Myers, 21 May 1984

COMMENTS: Chemical results and boring logs for off-base exploration borings

performed 29 March 1984 through 4 April 1984

FIRST AUTHOR: Rio Linda Water District

PUBLICATION YEAR: 1984

TITLE: Locations, Specifications, Geologic Logs, Water Quality and

Production Information for Rio Linda Water District Production

Wells in Close Proximity to the McClellan AFB Study Area

PAGES: 20 p.

SOURCE: Mason Adams, Rio Linda Water District, 13 June 1984

FIRST AUTHOR: Sacramento County Health Department

PUBLICATION YEAR:

TITLE: McClellan AFB Water Sample Data File, A-Z 16th-26th; 1/2-2/2

PAGES: 1000 p

SOURCE: Ken Knight, Sacramento County Health Department, 21 May 1984

FIRST AUTHOR: Scalf, M. R.

OTHER AUTHORS: J. F. McNabb, W. J. Dunlap, R. L. Cosby and J. S. Fryberger

PUBLICATION YEAR: 1981

TITLE: Manual of Ground-Water Quality Sampling Procedures PUBLICATION: National Water Well Association, Worthington OH

PAGES: 89

SOURCE: Radian Library

COMMENTS: General manual for well drilling, sample collection. Includes

good elementary background.

FIRST AUTHOR: Seray, D. H.

PUBLICATION YEAR: 1983 MONTH: August DATE: 22

TITLE: Letter and memorandum of understanding between USEPA and USAF for

assistance in the McClellan investigation

PUBLICATION: Letter to Brig. Gen. Trevor A. Hammond

PAGES: 9 p.

SOURCE: Obtained from USAF for the project proposal effort

FIRST AUTHOR: Shauer, W. T.

PUBLICATION YEAR: 1983 MONTH: July DATE: 28

TITLE: Letter to Brig. General Trevor A. Hammond from W. T. Shauer

describing the County of Sacramento comments/responses to the

McClellan AFB Phase II Study

PAGES: 2 p.

SOURCE: Obtained from USAF for the project proposal effort

FIRST AUTHOR: Stahler, J. L.

PUBLICATION YEAR: 1983 MONTH: July DATE: 28

TITLE: Letter to Brig. Gen. Trevor A. Hammond from CDHS describing comments

to the Phase II Report for McClellan AFB

PAGES: 2 p.

SOURCE: Obtained from USAF for the project proposal effort

FIRST AUTHOR: Smith, C. PUBLICATION YEAR: 1984

TITLE: Correspondence with Chuck Smith of CalTrans Marysville District

PAGES: 1 p. SOURCE: CalTrans

COMMENTS: Letter describing the locations of CalTrans irrigation

wells in the area of McClellan AFB

FIRST AUTHOR: Sutay, R. Lt. Col; Bioenvironmental Engineering Services, McClellan AFB

TITLE: Personal communications with E. W. Pearce, Radian Corporation

COMMENTS: Many personal communications regarding various project elements.

FIRST AUTHOR: Thomas Bros. Maps

PUBLICATION YEAR: 1983

TITLE: Street Atlas and Directory for Sacramento County

PUBLICATION: Thomas Bros. Maps

PAGES: 228 p.

SOURCE: Radian Library

COMMENTS: Contains detailed street maps for Sacramento County and the study

area.

FIRST AUTHOR: Trescott P. PUBLICATION YEAR: 1975

TITLE: Documentation of Finite Difference Model for Simulation of Three

Dimensional Flow

PUBLICATION: United States Geological Survey Open File Report 75-438.

PAGES: 32

SOURCE: United States Geological Survey

FIRST AUTHOR: USAF

TITLE: File of Summarized Analytical Results for Off-Base Wells

PAGES: 50 p.

SOURCE: USAF, Lt. Col. Milo G. Myers, May 21, 1984

COMMENTS: Water-quality for off-base wells for sampling events prior

to August, 1983.

FIRST AUTHOR: USAF

TITLE: Map of Past Waste Disposal/Storage Areas and Base Production and

Monitoring Wells for McClellan AFB

PAGES: 1 plate

SOURCE: USAF, LT. Col. Myers, May 21, 1984

COMMENTS: This map illustrates the locations of past waste disposal/

storage sites in addition to monitoring and production wells at McClellan AFB. These data are plotted on a 1:500 basic

layout map of the installation.

FIRST AUTHOR: USAF PUBLICATION YEAR: 1984

TITLE: Miscellaneous Off-Base Sampling Data Including Chain-of-Custody

Forms, Analytical Results for Samples Collected from the Base Industrial and Domestic Waste Water Treatment Plants and Field

Sampling Data

PAGES: 75 p.

SOURCE: Capt. Mario Ierarti

COMMENTS: This file contains chain-of-custody forms and field sampling data

from the off-base sampling program as received by the USAF from the CRWQB,CRV. Analytical results for samples collected from the

base industrial and domestic wastewater treatment plants have been included.

FIRST AUTHOR: USAF, McClellan AFB PUBLICATION YEAR: 1984 MONTH: May

TITLE: USAF Off-Base Well Status Map for McClellan AFB

PAGES: 1 plate

SOURCE: USAF, Lt. Col. Myers, May 21, 1984

COMMENTS: This map shows general location of off-base wells sampled under the Air Force quarterly well sampling program. Symbols are provided on the map to differentiate between wells which were last found to be contaminated and those which were found to be clean

(thru the last sampling).

Note: A change in well status occur when analytical changes are

noted for at least two consecutive sampling events. Several wells have changed status (to contaminated) but have not been indicated as so on the map. See analytical

records.

FIRST AUTHOR: USAF PUBLICATION YEAR: 1984

TITLE: Off-Base Well Information File

PAGES: 200 p.

SOURCE: USAF Lt. Col. Myers, 21 May 1984

COMMENTS: File contains drilling and general logs, locations (maps) and

address of numerous off-base wells.

FIRST AUTHOR: USAF

PUBLICATION YEAR: 1984 MONTH: April

TITLE: Off-Base Water Quality Data December thru April 1984

PAGES: 300 p.

SOURCE: Capt. Mario Ierarti, USAF, 25 May 1984

COMMENTS: This file contains water quality analysis for off-base wells sampled during the period from December 1983 through April 1984. This file set includes both quarterly and non-quarterly sampling records (non-quarterly analysis performed on an as-

required basis).

FIRST AUTHOR: USAF

PUBLICATION YEAR: 1983 MONTH: December

TITLE: Off-Base Water Quality Data October thru December 1983

PAGES: 150 p.

SOURCE: Capt. Mario Ierarti, USAF, 25 May 1984

COMMENTS: This file contains analysis for the McClellan AFB off-base

well sampling program for the October - December 1983 sampling

episode.

FIRST AUTHOR: USAF PUBLICATION YEAR: 1984

TITLE: Summary of Post-Phase Two Water Quality Determinations for Monitor Well 38d, McClellan AFB and Herbicide, Pesticide

Analyses for Selected Base Production Wells

PAGES: 45 p.

SOURCE: Lt. Col. Milo G. Myers, 12 June 1984

COMMENTS: This file contains summarized post-Phase 2 water-quality

determinations for well 38D.

FIRST AUTHOR: USAF PUBLICATION YEAR: 1984

TITLE: Quarterly Summaries of Weekly VOA Analysis for McClellan AFB Production Wells; Third Quarter, 1983 thru First Quarter, 1984

PAGES: 40 p.

SOURCE: Lt. Col Milo G. Myers, 12 June 1984

COMMENTS: This file set contains summaries of analytical findings for

the base production well VOA analysis from 3rd quarter 1983 through 1st quarter 1984. Information from this file was

distributed in the site-specific data base.

FIRST AUTHOR: USAF

PUBLICATION YEAR: 1983 MONTH: October DATE: 20

TITLE: Recent History of McClellan AFB Landfill/Sludge Disposal

Methods and Groundwater Contamination Investigations

PUBLICATION: USAF Internal Document

PAGES: 14 p.

SOURCE: Received from Capt. Mario Ierarti, 25 May 1984 during base visit.

COMMENTS: This USAF internal document lists milestone accomplishemnts for the McClellan AFB ground water investigations from 28 January 1976 through 20 October 1983. This document is due to be up-

dated in the near future.

FIRST AUTHOR: USAF

PUBLICATION YEAR: 1983 MONTH: September

TITLE: Off-Base Water Quality Data August thru September 1983

PAGES: 200 p.

SOURCE: Capt. Mario Ierarti, USAF, 25 May 1984

COMMENTS: This file set contains analysis for the McClellan AFB off-

base well sampling program for the August-September 1983

sampling episode.

FIRST AUTHOR: United States Department of the Interior

OTHER AUTHORS: Geological Survey

PUBLICATION YEAR: 1980

TITLE: Rio Linda Quadrangle, California 7.5 Minute Series (Topographic)

PAGES: 1 plate SOURCE: USGS

FIRST AUTHOR: United States Department of the Interior

OTHER AUTHORS: Geological Survey

PUBLICATION YEAR: 1980

TITLE: Rio Linda Quadrangle, California 7.5 Minute Series (Topographic) Map

PAGES: 1 plate SOURCE: USGS

FIRST AUTHOR: United States Department of the Interior

OTHER AUTHORS: Geological Survey

PUBLICATION YEAR: 1980

TITLE: Sacramento East Quadrangle, California, 7.5 Minute Series

(Topographic) Map

PAGES: 1 plate SOURCE: USGS

FIRST AUTHOR: United States Soil Conservation Service

PUBLICATION YEAR: 1954 MONTH: August

TITLE: Soil Survey of the Sacramento Area, California

PUBLICATION: United States Soil Conservation Service, Series 1941, NG. 11

PAGES: 105 p.

SOURCE: United States Soil Conservation Service COMMENTS: Describes soils in the Sacramento area.

FIRST AUTHOR: Weir, W. W.

PUBLICATION YEAR: 1950 MONTH: Appril

TITLE: Soils of Sacramento County California

PUBLICATION: University of California, Division of Soils

PAGES: 119 p.

COMMENTS: Earlier report on soils in Sacramento County, California

FIRST AUTHOR: Wilson, J. T. and R. L. Cosby and G. B. Smith

PUBLICATION YEAR: 1984

TITLE: Potential for Biodegradation of Organo-Chlorine Compounds

in Ground Water

PUBLICATION: EPA-600/D-84-138

PAGES: 17 p. SOURCE: NTIS

COMMENTS: Describes the results of experiments for the characterization

of the biodegradation of organo-chlorine compounds in ground

water.



APPENDIX 2-B

Methodology for the Reduction of Information from Site-Specific File Sets to the Computer Database



METHODOLOGY FOR THE REDUCTION OF INFORMATION FROM THE SITE-SPECIFIC FILE SETS TO THE COMPUTER DATABASE

Following the collection and assimilation of site-specific information into the on- and off-base file sets, data reduction efforts were initiated. Data reduction for the site-specific database consisted of reviewing and reducing information collected for approximately 1300 wells and borings in the study area.

Prior to the data reduction effort, a list of well/boring parameters of significance to the study was developed. A site-specific information summary form was designed from this list. The summary form was used for compiling the data from the file sets into a standard format for assimilation into the site-specific computer database. An example of this form is included in Figure 2.B-1. A listing of the codes used for completing the forms is included as Table 2.B-1.

The procedure used for the review of the site-specific data and for the completion of the site-specific information forms is listed below. In many instances, professional judgement was used for the data reduction effort. The procedure listed below should be considered as the general procedure used for data reduction.

1) IDENTIFICATION

For off-base areas, the address for each well location was written in the upper portion of the form to facilitate rapid identification and filing. Site-specific information forms and supporting data for each of the off-base wells have been assembled in the off-base file set by street and by address in ascending order.

On-base wells/borings have no addresses. These wells have been assigned an identification number by previous investigators, the Base or



INSTALLATION RESTORATION PROGRAM PHASE II (STAGE 2-1) McCLELLAN AFB, CALIFORNIA

GRID CELL: $\frac{1}{X}$, $\frac{1}{Y}$ (X = 01 - 19,	
	of Grid Origin)
COORDINATES: X = (Feet East Y = (Feet North	•
VARIABLES: Z_1 = (Source of Current Use Current Use Contaminated Contaminated Contaminated Current Use Contaminated Current Use Cur	Information) se) cion Status) Vater) of Water) ceened Interval - Elevation) Screened Interval - Elevation) Screened Zones) CE Concentration [ppb]) at TCE Concentration [ppb])
14	,2 DCA Concentration [ppb]) nt 1,2 DCA Concentration [ppb])
INFORMATION: (Summarize All Pertinent In	formation for This Location)
Source(s):	
(Name, Date, or "Well Inventor	7")

Figure 2.B-1. Site-Specific Information Form



TABLE 2.B-1. NUMERICAL CODES USED FOR COMPLETING SITE-SPECIFIC INFORMATION SUMMARY FORMS

Variable	Description	Numerical Code*			
z ₁	Source of Information	<pre>If: Well = 1 Boring = 2 Other = 3</pre>			
z ₂	Current Use	<pre>If: Domestic Supply = 1 Municipal Supply = 2 Industrial Supply = 3 Irrigation = 4 Monitor Well = 5 Piezometer = 6 Inactive = 7 Unknown = 9999</pre>			
z ₃	Contamination Status	<pre>If: Known to be impacted = 1 Known not to be impacted = 2 Unknown = 9999</pre>			
z ₄	Depth to Water	Static Water Level in Feet (below land surface or measuring point), if Unknown = 9999			
z ₅	Elevation of Water	Elevation of Static Water Level in Feet, if Unknown = 9999			
z _é	Top of Screened Interval	Elevation of the Top of the Interval from which the Well Receives Ground Water in Feet, if Unknown = 9999			
z ₇	Bottom of Screened Interval	Elevation of the Bottom of the Interval from which the Well Receives Ground Water in Feet, if Unknown = 9999			
z ₈	Number of Screened Zones	Number of Screened or Perforated Zones, if Unknown = 9999			
Z ₉	Highest Trichloro- ethylene (TCE) Concentration	Highest Concentration of TCE Expressed in Parts Per Billion (including "Not Detected"), if Unknown = 9999			

(Continued)

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TABLE 2.B-1. (Continued)

Variable Description		Numerical Code*			
z ₁₀	Most Recent TCE Concentration	Most Recent TCE Concentration Expressed in Parts Per Billion (including "Not Detected"), if Unknown = 9999			
z ₁₁	Land Surface Elevation	Land Surface Elevation in Feet			
z ₁₂	Highest 1,1-Dichloro- ethylene (DCE) Concentration	Highest 1,1-DCE Concentration Expressed in Parts Per Billion (including "Not Detected"), if Unknown = 9999			
z ₁₃	Most Recent 1,1-DCE Concentration	Most Recent 1,1-DCE Concentration Expressed in Parts Per Billion (including "Not Detected), if Unknown = 9999			
z ₁₄	Highest 1,2-Dichloro- ethane (DCA) Concentration	Highest 1,2-DCA Concentration Expressed in Parts Per Billion (including "Not Detected"), if Unknown = 9999			
z ₁₅	Most Recent 1,2-DCA Concentration	Most Recent 1,2-DCA Concentration Expressed in Parts Per Billion (including "Not Detected"), if Unknown = 9999			

^{*}The accuracy or precision of entries to the site-specific information summary form were specified, as required. Codes used to specify the precision of an entry are:

Default (no qualification) = Confirmed. Information accurate, considered factual.

- R = Reliable. Information reasonably accurate or believed to be accurate, but not confirmed.
- Q = Questionable. Information inaccurate or is suspect. Information should be used with caution.

Radian. The identification number for each base well was recorded on the upper portion of the site-specific information forms.

2) LOCATION

As discussed in Section 3.1, a cartesian coordinate system was established for the study area for specifying well/boring locations. The location for each well/boring was referenced by grid cell and grid cell coordinates.

Methods used for locating the wells and borings varied. The accuracy of the well locations also varied. Most of the wells located by the off-base well inventory effort (conducted by Radian) were located by measuring the distance from the well to a landmark, normally a roadway. In some instances, inventory personnel were not able to gain access to a given well. In such cases, the location of the well with respect to appropriate landmarks was estimated, provided that the well could be seen. If the well could not be seen, the well location was assumed at the center of the addressed property, as defined by County Assessor's Maps. In both cases, the estimated location was qualified as being reliable but not confirmed.

Numerous private wells were located by a state well survey conducted for the area southwest of McClellan AFB. Locations developed by the survey were considered as accurate and requiring no qualification.

Drillers' logs also provided location data for several wells. The precision with which drillers specified the locations of the wells varied. Wells whose locations were imprecise or unclear were assigned qualified locations. The degree of qualification was commensurate with the apparent precision/accuracy of the data based on the judgement of the data reduction personnel. In some cases, drillers' location data were so imprecise that the well had to be assumed to lie at the center of the indicated property. Location data for wells located at the center of a property were qualified as reliable.



Wells were also located by means of water-quality data from the off-base well sampling program. In some instances, water-quality data provided evidence that a well or wells existed at an address where none were previously noted. In this instance, the location of the well(s) was assumed to be at the approximate center of the indicated property. In this case, the well location was qualified as reliable.

On occasion, wells were spaced so closely together that coordinate data for one or more of the closely-spaced wells were changed slightly to facilitate plotting. If one or more wells were located within twenty feet of one another, the well coordinates of the closely spaced wells were changed such that they differed by twenty feet. A twenty-foot separation was determined as the minimum separation distance for plotting purposes.

3) SOURCE OF INFORMATION - Z1

The source of information for a data point was specified as a well or boring in Variable \mathbf{Z}_1 .

4) CURRENT USE - Z2

The current use of a well is specified by Variable Z_2 . Where a well was used for multiple purposes, its most critical usage was specified for Z_2 . As an example, if a well is used for both domestic supply and irrigation, its most critical use with respect to water quality is domestic supply. Thus, domestic supply would be specified for Z_2 .

5) CONTAMINATION STATUS - Z₃

The contamination status of a well is specified by this variable. A well was assumed to be contaminated if any organic compounds were found at any time. The well was assumed not to be contaminated if organic analysis for the well indicated that no organic compounds were present.

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6) DEPTH TO WATER - ZA

The depth to water for a well is specified by this parameter. Water level data for on- and off-base wells were obtained from several sources. Water-level measurements for on-base wells were obtained by Radian during September, 1984.

Water level measurements for off-base wells were obtained from water well drillers' logs, state well survey data, Radian well inventory data, sampling information, etc. Most of the off-base water level data are non-contemporaneous. Only 1983 or later data were entered as Variable Z_4 . Off-base water level data were considered questionable because they were developed by several investigators and because they are non-contemporaneous.

7) KLEVATION OF WATER - Z₅

The elevation of water in a well was determined by subtracting the value of \mathbf{Z}_5 from the land surface elevation (Variable \mathbf{Z}_{11}). The accuracy or level of confidence for this data is imparted by the lowest level of confidence for Variables \mathbf{Z}_5 or \mathbf{Z}_{11} .

8) TOP OF SCREENED INTERVAL - ELEVATION Z6

The highest elevation from which a well can receive ground water is specified by this parameter. If the information was specified by the well owner (in the case of a private well), the data was considered as questionable. Top of screen data obtained from drillers' records were also used. The top of the screen was considered to be the elevation of the bottom of a competent strata seal. The only strata seal considered competent was grout or cement.

Most of the data for Z_6 were available as depth. Thus, most values for Z_6 were calculated using Z_{11} . The accuracy of the Z_6 values is imparted by the lowest level of confidence for Variables Z_6 and Z_{11} .



9) BOTTOM OF SCREENED INTERVAL-ELEVATION - Z7

The lowest point of a well which receives ground water is specified as Variable Z₇. In almost all cases, the lowest point of a well to receive ground water was considered as the total depth of the well.

Most of the data for Z_7 were in depth. Depth specifications provided by the well owner (in the case of private wells) were considered as questionable. Values of Z_7 were calculated using the values for Z_{11} .

10) NUMBER OF SCREENED ZONES - Z8

The number of intervals from which a well receives ground water is specified as z_8 . Values for the variable were determined mostly from drillers' logs, where available.

11) HIGHEST TRICHLOROETHYLENE CONCENTRATION - ZQ

The highest historical concentration of trichloroethylene (TCE) determined for a well is specified by this variable. Chemical data were obtained from previous on- and off-base investigations.

12) MOST RECENT TCE CONCENTRATION - Z₁₀

The most recent TCE concentration (up to the time of this study) is specified by this variable.

13) LAND SURFACE ELEVATION - Z11

Land surface elevation for a well or boring was determined from United States Geological Survey quadrangle maps, drillers' logs, state well inventory data, and, in the case of on-base monitor wells, surveyors' data. Data obtained from topographic maps were considered as reliable but not confirmed.

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14) HIGHEST 1,1-DICHLORORTHYLENE CONCENTRATION - Z₁₂

The highest historical concentration of 1,1-Dichloroethylene is specified by this variable.

15) MOST RECENT 1,1-DICHLOROETHYLENE CONCENTRATION - Z₁₃

The most recent 1,1-Dichloroethylene concentration for a well is specified by this variable.

16) HIGHEST 1,2-DICHLOROETHANE CONCENTRATION - Z₁₄

The highest 1,2-Dichloroethane concentration is expressed by this variable.

17) MOST RECENT 1,2-DICHLOROETHANE CONCENTRATION - Z₁₅

 $\label{eq:concentration} \mbox{The most recent 1,2-Dichloroethane concentration is expressed} \\ \mbox{by this variable.}$

Pertinent specific data not included in the variables were listed in the general information summary section of the site-specific information form. Sources and dates for information entered on the site-specific forms were referenced on the forms, where necessary. All supporting documentation for the summary forms are provided in the Site-Specific Data File Sets. RADIAN

APPENDIX 2-C

General Information for McClellan AFB Ground-Water Monitoring Wells

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Pre-Phase II Monitor Wells

Monitor Wells 1 through 4 were installed by the Base during June 1980 as a preliminary effort for evaluating potential impacts to ground-water quality (Brunner and Zipfel, 1981). Monitor Wells 1, 2 and 4 are completed to a depth of about 250 feet below land surface to receive ground water from water-bearing strata extending from the water table to total depth. Monitor Well 3 was completed to a depth of about 200 feet.

Monitor Wells 1 and 2 penetrate several water-bearing strata. Because Monitor Wells 1 and 2 are located in areas of significant ground-water contamination, they were plugged or filled to prevent migration of contaminants within the wells. Monitor Well 1 was filled from total depth to land surface. Monitor Well 2 was filled from total depth to 60 feet.

During drilling, boreholes for Monitor Wells 1 through 4 were extended to a depth of about 400 feet. Based on well completion records, each well borehole was backfilled from a depth of about 400 feet to the well depth. A concrete plug was placed above the backfilled portion of the boreholes, just below the bottom of the well casing. Completion records do not specify the materials used for backfilling monitor well borings 1 through 4. The backfilled portions of these wells may serve as a pathway for vertical movement of contaminants.

Monitor Wells 5 through 9 were installed by the base between September and November 1980. The wells were installed under an expanded groundwater monitoring and soil sampling program conducted on the base (Brunner and Zipfel, 1981). These wells extend to depths of between 120 and 140 feet below land surface. Monitor Wells 5 through 9 are perforated from a depth of about 20 feet to total depth. Gravel packs installed in these wells extend from a depth of about three or four feet to total depth. A concrete seal was emplaced above the gravel packs to the surface.



Water level records indicate that ground-water exists at depths of approximately 80 to 100 feet in Monitoring Wells 5 through 9. Because of the extended perforated length of these wells, they may serve as conduits for vertical movement of contaminants. Contaminants possibly contained within unsaturated strata or perched ground-water zones may also travel through the vertically extensive gravel packs of these wells.

Base personnel reported that Monitor Well 5 has been lost and abandoned since its emplacement. According to Lt. Col Myers, formerly of the Base Bioenvironmental Engineering at McClellan AFB, the riser for Monitor Well 5 has been broken off and the remainder buried. Because this well is located in an area of industrial activity, it may allow rapid infiltration of surface contaminants to ground water.

Monitor Wells 10 through 15 were installed by the base as a further expansion of the monitor well network under the guidance of the United States Geological Survey during July 1981. Each of these wells were completed to a depth of approximately of 100 feet. Completion records obtained for these wells do not include detailed completion specifications (I.E. interval(s) of perforation, grouting etc.).

Phase - II Monitoring

Monitoring Wells 16 through 29 (shallow and deep completions), 30, 31, 33 through 50 were installed under the supervision of Engineering-Science in 1982 for Phase II, Stage 1 McClellan AFB IRP. The majority of these wells were installed in and around Waste Areas A, B, C, and D to determine the effects, if any, of base operations on ground-water quality. Well 32D was scheduled for installation in Phase II but was not installed (Engineering-Science, 1983).

Monitor wells 16 through 29 are multiple completion wells. These wells contain two separate sets of casing and screen to obtain ground water from the first and second water-bearing zones. The remainder of the Phase II

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wells are single completion. All of the remaining Phase II monitor wells, except monitor well 38D, were designed to obtain ground water from the first significant water-bearing zone. Monitor well 38D was constructed to obtain ground water from the second or "deep" water- bearing zone. In addition to the monitoring wells, two piezometers were installed during Phase II for the pump test conducted at Monitor Well 44S. The two piezometers (44S-A and 44S-B) are reportedly located 20-to-40 feet "downgradient" from Well 44S. The exact locations and specifications for these wells are unknown. Because of the proximity of these wells to past waste disposal sites, their locations, specifications, and status should be determined.

extend through as much as 50 feet of sediments. Where these extended gravel packs encounter two or more water-bearing zones they may serve to connect shallow contaminated strata with deeper previously uncontaminated units. Of particular concern is the method used for the completion of monitor well 38D. During drilling, the borehole for monitor well 38D was extended to about 225 feet below land surface. The borehole was then backfilled with gravel to a depth of about 135 feet. A five-foot layer of bentonite was placed above the backfilled portion of the hole as a seal. Casing, screen, gravel pack and sealing materials were then emplaced in the hole to complete the well. Based on the geologic log for Monitor Well 38D, the 90 foot section of gravel backfill below the bentonite plug penetrates more than one water-bearing zone. The gravel backfill may serve as a conduit for vertical migration of contaminants. This is an important consideration given the proximity of Monitor Well 38D to Waste Area D.

Phase III/IV Monitor Wells

Monitor Wells 51 through 57 were emplaced in the area of Waste Area D under the supervision of CH2M Hill. The wells were installed in the early part of 1984 for Phase III/IV site characterization study for Area D to develop more information on hydrogeologic conditions in the vicinity of Area D (CH2M Hill, 1984b). Monitor Wells 51 through 57 were completed to depths



ranging between 107 and 185 feet for the characterization of "shallow" and "deep" water-bearing zones.

One perched aquifer monitor well was emplaced within area D as part of Phase III/IV Site Characterization Study for Area D (CH2M HILL, 1984a). This well was installed during January, 1984, when perched conditions were encountered in Auger Boring A-5 at an approximate depth of 39 feet. The screen for this monitor well was set between 35 and 45 feet below ground surface. Following completion activities, the perched-zone well could not be sampled due to the limited amount of water produced to the well. For the purpose of the Site-Specific Database, this well will be referred to as Monitor Well 58P.

APPENDIX 3

This appendix provides information regarding Task 3, as discussed in text Section 3.3.

Appendix Contents

3-A Listing of Wells Identified During the Comprehensive Well Inventory



EXPLANATION OF APPENDIX 3-A - DATABASE WELL LISTING

Appendix 3-A is a printout of the wells listed in the Site-Specific database. Plate 3 is the corresponding representation of the database showing well usage and location.

An explanation of the database printout is given below:

Grid Column

This is the grid-cell number, from 1-to-19, representing the columns of grid-cells counting from the lower-left corner of the grid to the right (x-direction). For a few wells, the grid column number may be greater than 19 which indicates a well outside of the study area but included in the database.

Grid Row

This is the grid-cell number, from 1-to-25, representing the rows of grid-cells counting from the lower-left corner of the grid to the top (y-direction).

Column Coordinate

This is the x-coordinate, in feet, from the grid origin (lower-left corner).

Row Coordinate

This the the y-coordinate, in feet, from the grid origin (lower-left corner).



Current Use

These integers represent well usage where:

- 1 = Domestic Supply
- 2 = Municipal Supply
- 3 = Industrial Supply
- 4 = Irrigation
- 5 = Monitoring Well
- 6 = Piezometer
- 7 = Inactive (abandoned)
- 8 = Reconnaissance Boring (Radian)
- 9999 = Unknown usage

Address

Addresses of wells located in study area. Some wells (and reconnaissance borings) do not have addresses listed. These are either unknown or are on McClellan AFB.

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APPENDIX 4

This appendix provides information regarding Task 4, as discussed in text Section 3.4.

Appendix Contents

4-A Agency Correspondence Regarding Proposed Reconnaissance Boring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD— CENTRAL VALLEY REGION

3201 S STREET SACRAMENTO CALIFORNIA 95816-7090 PHONE -916/ 445 0270



21 June 1984

Captain Ieradi U.S.A.F. Clinic McClellan/SGB McClellan Air Force Base Sacramento, cA 95652

RADIAN CORPORATION'S PROPOSED RECONNAISSANCE BORINGS PLAN

Enclosed are the Regional Board's recommended changes to the Radian Corporation's reconnaissance borings proposal as discussed at the 21 June 1984 meeting.

I urge you to incorporate these changes into your contract with Radian Corporation as expeditiously as possible so as not to significantly delay this project.

Lory Flash Senior Engineer

JJT/gs

Enclosure

Mr. Jeff Rosenbloom, U.S. Environmental Protection Agency, T-4-1 cc:

Mr. John Wesnousky, Department of Health Services, Toxic Substances Control Division, Sacramento

Mr. Carl Lischeski, Department of Health Services, Sanitary Engineering Section, Sacramento

Mr. Ken Knight, Sacramento County Health Dept. Mr. Lee Harry, City of Sacramento

Memorandum

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD . CENTRAL VALLEY REGION

3201 S Street

Sacramento, California 95816

Phone: 445-0270

TO:

Larry F. Nash

Senior Engineer

FROM: J

John J. Tomko

Area Engineer

DATE:

22 June 1984

SIGNATURE

17 + Took forth

SUBJECT:

RADIAN PROPOSAL ON RECONNAISSANCE BORINGS OFF-BASE AT MC CLELLAN AIR

FORCE BASE

I met with the Air Force, Radian Corporation, the Department of Health Services, and the City and County of Sacramento on 21 June 1984 at McClellan on the proposed reconnaissance boring plan for off-base areas at McClellan.

I recommended the following changes be made to the proposal:

- 1. Additional borings be drilled at the following locations:
 - a. One boring between 'G' and 'I' Streets along 24th Street.
 - b. One boring at the intersection of Dry Creek and Ascot Avenue, near City Well 154.
 - c. At least 2 additional borings within the central off-base area bounded by Ascot Avenue, Raley Boulevard, Main Avenue and the Webster Property Line of the Base.
 - d. Additional borings, south of the Base, to identify and locate the buried channel bed described in Department of Water Resources Bulletin No. 118. At least 3 may be required.
 - e. The consultant should consider additional upgradient borings per the Department of Health Services' recommendation.
- 2. All borings should be to a maximum depth of 200 feet, not 150 feet.
- 3. Four water samples per boring should be taken instead of three because of the increase in boring depth and the distinct possibility of encountering a deeper water bearing zone below the 150 foot level.
- 4. HNU's readings should be taken and correlated with boring depths at those borings drilled adjacent to Base boundaries.



APPENDIX 5

This appendix provides information regarding Task 5, as discussed in text Section 3.5.

Appendix Contents

- 5-A City of Sacramento Encroachment Permit
- 5-B Sacramento County Department of Health Drilling Permit
- 5-C Reconnaissance Boring Drilling Logs
- 5-D Results of Grain-Size Distribution Analyses of Soil Samples
- 5-E Results of Laboratory Analyses of Water Samples
- 5-F Raw Laboratory Data for Selected Water Samples (Volatile Organic Analysis EPA 601)



APPENDIX 5-A

City of Sacramento Encroachment Permit

_	<u> </u>	1	-	_:
_				_
	STA	107	' DATE	

Radian Corporation

- 3401 La Grande Blvd.

ZIP: 95823

MAPPlication is hereby made for an Encroachment/Excavation Wermit to perform the following:

- La Applicant's work order or job number: _
- 2- Location of work: 45 & W side McClellan AFB
 - General description of work to be done: Exploration *borings 5 1/8" diameter for soil & water testing.

Gee a Hachment,

Estimated start of works 7/30/84

Estimated time

meded. days.

5. Name and phone number of person familiar with details:

E. Wayne Pearce (916)421-8700

NOTE: Submit application (2 copies) - Attach sketch (2 copies) showing plan and cross-section, indicating clearly location of work with respect to face of curb, edge of pavement or property line.

SIGNED: El Nupre Conce

COMPLETION DATE

U.S.A. NUMBER

ROUTING AS NECESSARY:

DEPARTMENT: INITIALS:

Engineering

RC7 Traffic Eng.

Waterswee

Street Maint

TRAFFIC COMMANDER (YES): (NO)

Approval and issuance of this permit subject to a \$120.00 fee in compliance with ordinance #83070.

Application approved as indicated on reverse. Call City street Maintenance Division. telephone 449-5236 or 449-5386, for permit number, not less than 2- hours prior to starting work. Permit will thereupon be issued.

Supervising Engineer

Street Maintenance Superintendent

Name and Collegions number of squary inspector, contractor, beared or supervisor appropriate of

All work is subject to the requirements of City Ordinance #4250 and the supplements thereto. Your attention is particularly directed to the following:

- 1. Permit good for <u>42</u> days from date of issuing permit number.
- 2. Unless otherwise indicated, working hours are 8:30 a.m. to 4:00 p.m. Mon. Fri
- 3. Adequate barricading and/or flagging shall be provided.
- 4. Trench backfill in street section to have relative compaction of 95% and shall be brought up in lifts of not over 8 inches. Upper 12 inches of trench backfill to have 8 inches of Class II compaction road rock and 4 inches of asphaltic concrete. Trench backfill off paved area to have relative compaction of 90%.
- 5. All concrete to be saw cut according to Section 4 of the "Standard Operating Procedures".
- 6. All asphaltic concrete repaying in the street right of way shall be accomplished by City forces. Compensation shall be at the established rate.
- 7. All "Cal-Osha" safety regulations shall be complied with.
- 8. "Underground Service Alert" (USA) 800-642-2444 and City Electrical Division 449-5287 shall be notified 48 hours prior to beginning work.

"SPECIAL PROVISIONS"

EXCAVATION PERMIT - CITY OF SACRAMENTO

Date July 26, 1984	Permit No. p-072784-1
with, Ordinance No. 4250, 4th Se	Sacramento, under provisions of, and in accordance eries, adopted by the City Council of the City of aly, 1979 does hereby grant permission to:
Agency Radian Corporation	Job No
3401 La Grande Blvd.	95823
to make excavations as follows:	(Location and description)
S & W side McClellan AFB	
Exploration borings 5 1/8" d	iameter for siol & water testing.
RESTRICTIONS: See general prender permit.	rovisions on reverse side of application for
	M. Johnson, Public Works Director

Street Maintenance Superintendent

Eng. Dept. St. Maint Form 3 (revised) 10/82



APPENDIX 5-B

Sacramento County Department of Health - Drilling Permit

APPLICATION & WATER WELL JOB PERMIT

SACRAMENTO COUNTY Department of Health

(916) 366-2101

ENVIRONMENTAL HEALTH BRANCH 3701 Branch Center Road

•), CA 93021	'		
Approved: Disapproved: By:	FOR OFFICE US	Passert # 067	40 Permit #:	007408
Grout Inspection by:		(Permit expires 1 year Final Inspection By: _		
COMMENTS:				
for a per JOB LOCATION: Area Surro		ty of Sacramento Health C tion as indicated below: PARCEL #:		
NEAREST CROSS STREET:				
OWNER'S NAME		PHONE #: _		
OWNER'S ADDRESS		CITY:		
CONTRACTOR'S NAME Water	Development Corporati	ion LICENSE #:	203325	
ADDRESS: 220 N. East St.	CITY: Wood	dland, CA	PHONE #: (016) 552-2829
WORK TO BE PERFORMED: Construct well (new) Deepen well Repair well (state work) COMMENTS:	☐ Install new pu☐ Repair pump☐ Replace pump		Abandon well Other (state) exploratory bor	fngs
DISTANCE TO NEAREST:		Property line	Other we	ell
INTENDED USE: Domestic/private Domestic/public Irrigation Industrial Other (state) Exploratory COMMENTS: Exploratory bo	TYPE OF WELL Caule Drilled Driven Caule The Driven The Driven The August Other (state)	CONSTRUCTION SPI Well depth 150 ft Gage of casing non Grout depth 150 ft I'r Gravel Pack: Yes Conductor: Yes Co	ECTIFICATIONS Diameter 5 1 Depth Type neat C No 1 No 1 Id Crout Seal	/a#
PUMP INSTALLATION/REPAIR: CONTRACTOR:				
TYPE OF PUMP:	Diameter: 5 1/8" om to top after drill	Ing Depth! 150 ft	Material to be use	neat d: cement
I hereby agree to comply to all Code or regulating well construction. With Sacramento Community Health Age CALL FOR A GROUT INSPECTION	hin ten (10) days after completion ncy a Well Driller's Log Report a	on of work on a new well, and will notify them befor	, I will furnish the Cour re putting the well in u	nty of
SIGNED LaWiggue	Pema	, ,	eologist-Projec Corporation	t Pirector

SHOW: parcel dimensions, adjacent streets, location of nearest septic tank system, location of nearest well, location of structures or any other information that would be pertinent.

APPLICATION & WATER WELL JOB PERMIT

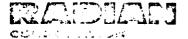
SACRAMENTO COUNTY Department of Health

(916) 366-2101

ENVIRONMENTAL HEALTH BRANCH 3701 Branch Center Road Sacramento, CA 95827

		Jacrament	o, e, t , , , ,	
	FOR OFFICE USE	ONLY	<u> </u>	00740:
Approved Disapproved:		Receipt # 5614	/ / Permit # _	
By the Killing	Date 6 - 35 - 39	Total Fee: FC	Date Issued:	6-16.14
·		(Permit expires 1 yea		
Grout Inspection by:		-		
. Date:		Date:		
COMMENTS.				
	tion is hereby made to the County		Officer	
	ermit to perform work at the location			
JOB LOCATION: Area Surro	bunding McClellan AFB	PARCEL #:		
NEAREST CROSS STREET:				
OWNER'S NAME		PHONE #:		
OWNER'S ADDRESS		CITY:		
CONTRACTOR'S NAME Water	r Development Corporation	on LICENSE #	283326	
ADDRESS 220 N. East St				6) 662-2829
WORK TO BE PERFORMED:				
Construct well (new)	Install new pum	qn	Abandon well	
Deepen well	Repair pump		. 🗘 Other (state)	
Repair well (state work)	☐ Replace pump	20	exploratory bo	rings
COMMENTS.			K.K.	
DISTANCE TO NEAREST				
Septic Tank system	Sewer line	Property line	Other v	veil
INTENDED USE:	TYPE OF WELL	CONSTRUCTION SE		
Domestic/private	☐ Cable	Well depth 150 f	† 2 Diameter 5	1/8"
Domestic/public	☼ Drilled	Gage of casing	ne	
Irrigation	☐ Driven	Grout depth 150 f	t. Joy neat	cement
Industrial	🔀 Rotary Dual Tube Ai	r Gravel Pack: Yes 🗆	□ No 🏝	
🗶 Other (state)	Other (state)	Conductor: Yes 🗔	No 🏗	
Exploratory			<u>lid Grout Seal</u>	
COMMENTS Exploratory b	orings-will be cemented	bottom to top	after drilling	
PUMP INSTALLATION/REPAIR:	N/A			
CONTRACTOR:				neat
TYPE OF PUMP:	HF	Depth Jet ft		
WELL ABANDONMENT:	Diameter: 5 1/8" tom to top after drilli		Material to be us	ed: Cemeric
I hereby agree to comply to all Coo	les Rules and Regulations of State	of California and the C	County of Sacramento	pertaining to
or regulating well construction. Wi	•			
Sacramento Community Health Ag	ency a Well Driller's Log Report an	id will notify them befo	ore putting the well in	
CALL FOR A GROUT INSPECTIO	IN PRIOR TO GROUTING AND F			
1. 1.1		•	geologist-Proje	ct Director
SIGNED CONTENTS	e farece	TITLE Radia	n Corporation	_
	DRAW PLOT PLAN ON HE	VERSE SIDE		

SHOW parcel dimensions, adjacent streets, location of nearest septic tank's litern, location of nearest well, location of structures or any other information that would be pertinent.



NOTE ACCOMPANYING DEPARTMENT OF HEALTH DRILLING PERMIT

Radian Corporation, under contract to the U.S. Air Force, is requesting a permit to drill 20 reconnaissance (exploratory) borings in the area surrounding McClellan Air Force Base. The borings will be drilled by our subcontractor, Water Development Corporation, by dual-tube air rotary methods and will be cemented from total depth (~150 feet) to the surface as the drill stem is extracted.

An attached map shows the initial boring site locations. The actual locations will be dependent upon field conditions and property access.

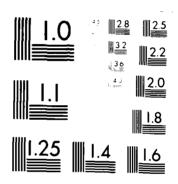
At the completion of this drilling program, Radian will submit to the Health Department the locations of each boring, drillers logs, and information regarding the abandonment of each hole.

Signed: Lillai Terre 1984

Title: Hydrogeologist - Project Director, Radian Corporation

DATE \$6/21/849	SACRAMENTO COUNTY HEAL RECEIPT FOR FEES AND		 E -03747					
ECEIVED FROM Radian Cov								
CASH BY MONEY ORDER BY CHECK O 1997 LOCATION MCCLELLON ATB								
E:			ACCT. NO.					
9290	ENVIRONMENTAL HEALTH	9790	9698					
PDF - DISPOSAL SITE	STC - SEPTIC TANK CLEANER	☐ MIS - MISCELLANEOUS	RCX GRADE A DAIRIES					
AHX FARM LABOR CAMP	☐ ABX - SEWAGE SYSTEM	9613	REX - MILK PROCESSORS					
TEX FOOD ESTABLISHMENT	SWS - SMALL WATER SYSTEM	SWF - WITNESS FEE	RHX - MFG MILK DAIRIES					
TWC - INFECTIOUS WASTE	ADX WATER WELLS / PUMPS		☐ RKX - SOFT SERVE					
AEX LOAN CERTIFICATIONS	9643		RNX NON-DAIRY DESSERT					
PHM PERM OCCUPANCY HOTEL	TPX FOOD PLAN CHECK	SACRAMENTO C	OUNTY HEALTH DEPARTMENT					
ACX POOL SERVICE CO.	ZBX POOL PLAN CHECK		ECTOR OF HEALTH					
. SCX PUBLIC POOL	9644							
GEX - REFUSE EXEMPTION	NSE NOISE ASSESSMENT							
•	MPR - MAP REVIEW	8Y	AZ'					
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APPENDIX 5-C

Reconnaissance Boring Drilling Logs

Log of Drilling Operations

Boring or Well No. $\frac{RB-1}{5}$ Sheet $\frac{1}{5}$

Location No	rtheast	of I	and	34th	St.	
Grid Cell 18						
Coordinates	Х	17,	450'			
	v	23.	2301			

Project McClellan AFB IRP Phase II

Beginning 9/5/84 and end
9/6/84 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Prill Rig and Operator Prill Tak DAOK/S Smit

Ground Level Elevation: apx.82 ft.MSL (topo).

Type Drill Rig and Operator Drill Tek D40K/S.Smitl Log Recorded By R.A. Belan

	Log Recorded Sy K.A. Belan							
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
0	G			SAND, SILT and CLAY: brown, smells organic, unconsolidated	Drilled by the dual tube air rotary method. OVM (ppm) 70			
- - - - 10	С			SAND and SILT: VF, tan dry, uncon- solidated	12.5			
	С			CLAY: brown, dry (?), unconsolidated	66			
20	С			SAND: Md-Fn, tan, uncondolidated	8.0			
25	С			CLAY and SAND: brown, unconsolidated, dry, Cs-Fn	1.7			
30	С			SAND: minor clay, tan, dry, uncon- solidated	0.7			
- - - 35	С			CLAY: plastic, brown, unconsolidated	0.8			
- - - - 40	С			CLAY: plastic, brown, unconsolidated	1.5			

Log of Drilling Operations

Boring or Well No. $\frac{RB-1}{5}$ Sheet $\frac{2}{5}$

Location Northeast of I and 34th St.	Project McClellan AFB IRP Phase II
Grid Cell 18:24	Beginning 9/5/84 and end
Coordinates x 17,450'	9/6/84 of drilling operation
y 23,230'	Sampling Interval (Estimated) Composite 5 (ft)
	Type Drill Dig and Operator Drill Tek D40K/S. Smi

D40K/S.Smith Ground Level Elevation: apx.82 ft.MSL (topo). Type Drill Rig and Operator Drill Log Recorded By R.A. Belan

				Log Recorded By R.A. B	elan
Depth (ft)	Tvpe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
40 - - - - 45	С			CLAY: brown, plastic, unconsolidated	
- - - - 50	С			CLAY: brown, plastic, unconsolidated	Driller cut w/water _
	С			CLAY: sand	41.9
— 60	С			CLAY: same	71.4
– 65	С			CLAY: same	64.0
. 70	С			CLAY: same	70.0
- 75	С			CLAY: same	12.0
- - - - - 80	C			CLAY: same	6.0

R	A	D	3	A	N
**	-		~	4	

Log of Drilling Operations

Boring	or \	Well	No.	RB-	-1
Sheet	_	3		of _	5

Location	Northeast of I and 34th St	Project McClellan AFB INP Phase II				
Grid Cell		Beginning 9/5/84 and end				
Coordinates	x 17,450'	9/6/84 of drilling operation				
	y 23,230'	Sampling Interval (Estimated) Composite 5 (ft)				
Cround Leve	1 Flevation: apx.82 ft MSL (topo).	Type Drill Rig and Operator Drill Tek D40K/S.Smit				

Ground Level Elevation: apx.02 ft.MSL (topo). Log Recorded By R.A. Belan

				Log Recorded By K:A: Bel	
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
30 - - - - 85	C			CLAY and SAND: brown, interbedded, unconsolidated	83
- - - - - -90	С			CLAY and SAND: same, gravel and sand at 89'	26.6
- - - - 95	С			CLAY and SAND: same	50.5
	С			CLAY and SAND: same	14.0
- - - - 105	C			CLAY and SAND: same	19.8
- 	C			GRAVEL, CLAY and SAND: brown, no free water, unconsolidated	Driller cut w/water- 22.3 -
_ _ 113	C			CLAY and SAND: brown, unconsolidated	Driller cut w/water_ 7.4
- - 120	С			CLAY and SAND: same	WL: ~97', T°C=23°C, C: 270, pH: 7.5

R	1DI	AN
COO.		-

Log of Drilling Operations

Boring or Well No. RB-1 Sheet 4 of 5

Location	Northeast of I and 34th St.	Project McClellan AFB IPP Phase II				
	8:24	Beginning_		and end		
Coordinates	x17,450'		9/6/84	of drilling operation		
	y23,230'	Sampling In	iterval (Estimated)_	Composite 5 (ft)		
				11 Pak Browne case		

Ground Level Elevation: apx.82 ft.MSL (topo). Type Drill Rig and Operato Prill Tek D40K/S.Smith Log Recorded By R.A. Belan

				Log Recorded By	
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
120					-0.2 (background)
T					(5.5.5.5.5.5.7.7.7.7.7.7.7.7.7.7.7.7.7.7
F	С			CLAV and CAND. interpolated to co	⊣
-				CLAY and SAND: interbedded, tan to brown, Fn-VF, unconsolidated, no free	. ⊢
-				water	-
125	! !	Ì	49000000000000000000000000000000000000	water	-
⊢					4
-					
 -	С			SAND: FN-VF, dry (?), unconsolidated	0.1
L	ļ	Į			"
130					
L					
					l i
Γ	C			CAND CAN AV.] ,]
Γ		}		SAND and CLAY: same	0.1
135		Ì] -
<u></u>	1				-
-	ţ				-
-	L	1		SAND and CLAY: interbedded	No obvious water —
-	}				from cuttings.
140		ł			WL: 110 BGL, T=23°C,
L					C: 160, pH: 7.4
<u>L</u>		<u> </u>			
L]
L	С			CLAY and SILT: interbedded, tan, dry(?)	·
145	}			unconsolidated, no free water	
[147	1				
	1				1 1
Γ	С			CLAY and SAND: tan, hard, dry (?),	Driller cut w/water
Γ] ~	[unconsolidated	1.4
h]			anconsolituated	* * " -
150]				→
		1			-
-					1 -
-	С			CLAY: brown, hard, unconsolidated	Driller cut w/water -
-	1			, .	3.0
155	1				-
⊢ .,,]	1			1
L	1	1			5.7
L	С	1		CLAY and SAND: interhedded brown	No obvious water
L] ~			CLAY and SAND: interbedded, brown, unconsolidated	WL: 127'BGL, T=23°C,
<u> </u>		1		unconsoliqueeu	C: 230, pH: 7.5

Log of Drilling Operations

Boring or Well No. RB-1 Sheet 5 of 5

Location	Northe	ast	of	1	and	34th	St.	1
Grid Cell	18:24							
Coordinates	X	17	45	01				•
	у	23.	.23	0'				•

Project McClellan AFB IRP Phase II

Beginning 9/5/84 and end 9/6/84 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Drill Tek D40K/S.Smith
Log Recorded By R.A. Belan

Ground Level Elevation: apx.82 ft.MSL (topo).

Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160 165	С			SILT and SAND: minor clay, tan, dry(?) no visible water, unconsolidated	0.3 (background)
_ - - 170	С			CLAY: brown, dry, hard, unconsolidated	Driller cut w/water
175	С			CLAY: brown, hard, dry, unconsolidated	1.7
180	С	RB-1-4		CLAY: brown, hard, dry, unconsolidated	2.6 Driller cut w/water - WL: 122'BGL, T: 21°C. C: 170, pH: 7.4
- - - 185	С			SAND: Cs-Md, mottled, black to tan, water produced, ang-subang, clear quartz grains, white grains (shells?)	30.5
190	С			SAND: same	2.1
- - - - 195	С			CLAY: brown, hard, dry, unconsolidated	23.6
200	С	RB-1-5		SAND and CLAY: interbedded, brown, water, unconsolidated Total Depth: 200 Feet	WL: 132 BGL, T=21°C, C: 180, pH: 7.8 — Grouted hole through- dual tubes w/ sacks Portland Cement Type I & II

1 H.1 16',Cb

R	ADI	AN		Log of Drilling	•	ing or Well No. $\frac{RB-2}{\text{of } \frac{5}{}}$	_
Grid	tion Cell dinates	х	9. 20 8075 9750		Project NcClellan AFB I Beginning 8-14-84	and e	
Grou	nd Level			55 ft.MSL (topo).	Tuna Daill Dia and Onesale	r <u>Drillsyst</u> em 1000 C	SR/
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
0				Surface Casing		Drilled by the du tube air rotary method.	al _
5	С			SILT: Moist, bro	own, fine grained	0.0	
10					om, rane grazuea	0.0	1
- - 15	С			Same as above		0.0	
20	С			SILT: Fine, yell	low-brown, powder	0.5	
25	С			CLAY: Silty, poo	or plasticity	Injecting H ₂ O	
- -	С			CLAY: Silty, yel	low, poor plasticity	2.5	
30	С			SILT: With mino	r clay, yellow-brown	1.7	+ + + + + + + + + + + + + + + + + + + +
35 	С			CLAY: Silty, bro	own, poor plasticity	0.4	484 16766

R	ADIA	AN		Log of Drilling	Operations	Boring or Well No. RB Sheet 2 of	5
		×				ar of drilling ope	ration
Grou	nd Level			ft.MSL (topo).	Type Drill Rig and Ope	rimated) Composite 5 eratorDrillsvstem 1000 Walters L. Hol	O CSR/
Depth (ft)	Tvoe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	•
40 -	С			SILT: Sandy, und sorted, sand 2	consolidated, poorly 5%	y 0.4	
45 	С			CAND. Silty DO	orly sorted, brown	0.3	7
50				unconsolidated		0.5	4
- - - - 55	С			SAND: Micaceous interbedded	, with brown clay,	0.6	
60	С			CLAY: Silty, go	od plasticity, brow	0.5	
65	С			SAND: Silty, mo water, 60'-61'	sist, possible perch		1
- - -	С			SAND: Silty, wi perched zone	th minor clay, out	0.6	- - - - -
70	С			CLAY: Silty, to	air plasticity	0.9	1
75	С			SAND: Clayey.	clay 10%, brown, san d, cemented	2.1	4-1-1

- 80

R	ADIA	ZN		Log of Drilling	_	Boring or Well NoRB-2 Sheet3of5_	
Grid					Project_McClellan AFB_IPP_Phase_II Beginningand endof drilling operation Sampling Interval (Estimated) Composite 5 (ft)		
Grou	nd Level	Elevat	ion: 55	ft.MSL (topo).	Type Drill Rig and Opera Log Recorded By T. W	tor Drillsystem 1000 CSR/ alters L. Holtort	
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
80 - - - - 85	С			SAND: Hard, cem	ented, clay matrix	2.2	
- - - - - - 90	С			SILT: Sandy, lo cutting into f	sing circulation and ormation	0.9 Lost circulation -	
- - - 95	С			No return, lost	circulation	Lost circulation	
_ _ _ 100	С		######################################	No return, lost	circulation	Water sample 3.2 pH = 6.0 Conductivity = 230 Temperature = 23°C	
_ - - 105	С			SAND: Clayey wi stringers	th some coarse gravel]	
- - - 110	С			No sample		-	
- - - 115	С			SAND: Silty, po subangular, cl	oorly sorted quartz, lear-yellow	0.9	
120	С			SAND: fine-med: sorted	ium grained, poorly	:25 gpm	

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R	ADIA	7 PV		Log of Drilling Operations Bor	ing or Weil No. RB-2 eet of 5						
Grid	Cell	×		Project McClellan AFB I Beginning	and end						
Grou	Sampling Interval (Estimated) Commosite 5 (ft) Ground Level Elevation: 55 ft.MSL (topo). Type Drill Rig and Operator Drillsystem 1000 CSR/Log Recorded By T. Walters L. Holtort										
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic	Lithologic Description	Remarks						
120 - - - - 125	С			SAND: Clayey, sand is fine grained, moderately sorted	0.9						
- - - - - 130	С			CLAY: Yellow-brown, very good plasticity	0.3						
_ _ 135	С			SAND: Coarse, poorly sorted with clay stringer 134'-135'	±25 gpm -						
- - - - 140	С			CLAY: Sandy, water bearing	0.4 Water sample pH = 7.5 Conductivity = 200						
- - - 145	С			SAND: Very coarse, poorly sorted with minor gravel	Temperature = 19°C						
150	С			SAND: Coarse, poorly sorted with clay stringer 149'-150'	0.8						
	С			SAND: Fine-medium grained, quartz subangular, clear-yellow, clay 154'	0.6						
- - - -	C			SAND: Cemented - 155'-159'; Clay - 159'-160'; Sand - 160'	Water sample pH = 7.8 Conductivity = 210 Temperature = 18°C						

COR	ADIA	AN		Log of Drilling	CL.	ring 3. Well No. RB-2 set5 of5
Grid	Cell	x			Project_McClellan AFB_I Beginning	of drilling operation
Grou	nd Level	<u> </u>		ft.MSL (topo).	Sampling Interval (Estimat Type Drill Rig and Operato Log Recorded By <u>T. Wall</u>	Drillsystem 1000 CSR/
Depth (ft)	Tvpe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
160	С			CLAY: Silty, si poor plasticit	lt 25%, clay, brown y	0.1
165 _ _ _	С			SAND and CLAY:	Interbedded, water	0.2
- - 170 -					is conforming at 170'	
- - 175	С			SAND: Cemented,	, red, fairly well aquifer	±50 gpm 0.6 sieve=silt
- - - 180	С			SAND: Medium gi sorted	rained, fairly well	Water sample pH = 7.8 Conductivity = 190 Temperature = 18°C
185	С			CLAY and SAND: decrease in s	Interbedded, 50% each, and with depth	0.1
190	C			CLAY: Sandy, i	nterbedded	0.6
19	C			SAND and CLAY:	Interbedded	0.1 Lost circulation 1942
200	C			SAND: Silty wi Total Depth: 20	th minor clay	Grout hole through dual tubes w, sacks Portland Cement Type I & II

R	ADIA	an		Log of Drilling Operations Born	ng or Well No3 et of5	
Grid	ation Cell rdinates	6, x 560 y 198		Project_McClellan AFB II Beginning Sampling Interval (Estimate	and end of drilling operation g) Composite 5 (ft)	
Grou	ind Level	l Elevat	ion:	Type Drill Rig and Operator Log Recorded By W. Boett		000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks	
- - - - - -	С			SILT: Sandy, fine to very fine, angular to subangular, tan	ovm(ppm)	
- - - - -10	С			SAND: Silty, clayey, fine grain, tan to brown	0.0 -	
- - - -15	С			SILT: Sandy, clayey, fine to very fine, red brown	0.04	
20	С			SAND: Silty, clayey, fine to very fine grain, subangular to subrounded, clay increasing with depth, brown	0.0	
- - - 25	С			SAND: Clayey, fine to very fine grain, subangular to subrounded, clay in-creasing with depth, brown	0.0	
- - - -30	С			SAND: Clayey, fine to medium grain, subangular to subrounded, brown	0.0	
- - 35	С			SAND: silty, medium to course grain, brown	0.0	
- - - 40	С			SAND: Medium grain, trace of silt, clay, brown	0.0	4 84 1656

R	ADIA	N		Log of Drilling	Operations Born Shee	ng or Well No. $\frac{3}{\text{et}}$ et $\frac{2}{\text{of}}$ of $\frac{5}{\text{ot}}$			
Location Project McClellan AFB IRP Phase II Grid Cell Beginning and end Coordinates x of drilling operation y Sampling Interval (Estimated) Commosite 5 (ft) Type Drill Rig and Operator Chicago Pneumatic CP2(C) Log Recorded By W. Boettner B. Horst									
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks			
- 40 45	С			SAND: Silty, cla grain, brown	ayey, medium to fine	0.0			
- - - _ 50	С				avelly, medium to coarse ded to rounded, brown	0.0			
- - - - - 55	С			SAND: Medium gra	ain, clean	0.0	- - - - - -		
55	С			SAND: Clayey, fi dark brown	ne to medium grain,	0.0			
- - - - - - 63	С			CLAY: Silty, mid	caceous, brown	0.0			
70	С			CLAY: Silty, mic	gaceous, brown	0.0	-		
- - - -	C.			CLAY: Silty, mic	gaceous, brown	0.0			
<u>-</u>	С			CLAY: Silty, sar	ndv, highly plastic	0.0	- - - - - - - - - - - - - - - - - - -		

R	ADIA	AN		Log of Drilling	/5 to	etof
Coordinates x						
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
- 80 - - - 85	С			SAND: Silty, cl grain, brown	ayey, fine to very fine	0.0
- - - - - 90	С				clayey, silty, medíum n, subround to round	0.0
- - - - 95	С			SAND: Silty, fi brown	ne to very fine grain,	0.0
	С			SAND: Silty, fi water	ne to very fine, tan	0.0 Water sample at 100'- pH=4.3 Cond. = 200 Temperature = 22°C
105	С			SAND: Silty, wa	ter	0.0
- - - - - 110	C			SAND: Silty, ve	ry fine grain, tan	0.0
115	С			GRAVEL: Sandy,	silty, tan to brown	0.0
120	C			SAND: Gravelly, coarse grain,	silty, medium to brown	0.0

R	ADIA	AN		Log of Drilling	<u> </u>	ng or Well No. 3 et4of5
Grid Cooi	Cell rdinates	х у		55 ft. MSL (topo).	Sampling Interval (Estimate	of drilling operation d) Composite 5 (ft) Chicago Pneumatic CP200
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
120	Ċ			SAND: Silty, ver	ry fine grain, brown	0.0
- 131	r)			SAND: Gravelly, grain, brown	silty, fine to medium	0.0
_ 				CLAY: Gravelly, brown	sandy, high plasticity,	0.0
	C			SAND: Clayey, Fe	eO _x staining, Red brown	0.04
_ _ 145	С			SAND: Silty, fir	ne to very fine grain	0.04
- - - - - 150	C			SAND: Silty, fir	ne to very fine grain	0.02
_ _ _ 1 55	C			SAND: Silty, spa	arse gravels, tine to	0,01
160	C			SAND: Silty, med brown	lium to fine graiu,	0.01 Water sample at 160! pH = 4.7 Temperature = 18°C Conductivity = 200

R	ADIA	AN		Log of Drilling		eet of5
Location					camping michial (Estimat	of drilling operation ed) Composite 5 (ft) Chicago Phermatic CP2000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
_ 160 _ _ _ _ 165	С			SAND: Medium to staining,brown	coarse grain, FeO _x	0.02
170	С			SAND: Clayey, si grain, plastic,	lty, fine to medium brown	0.02
- - - 175	С				yey, fine to medium plastic, brown	0.04
180	С			SAND: Silty, med	ium to coarse grain	0.02 Water sample at 180'- pH = 5.6 Temperature = 20°C Conductivity = 190
185	С			SAND: Clayey, mi fine grain, rec	icaceous, fine to very d brown	0.04
190	C			SAND: Micaceous. grain, reddish	, fine to very fine brown	0.02
195	C				, clayey, fine grain, g with depth, red brown	0.01 0.01 0-200' 4½" hole
- 700	C			slightly micaco	eous, brown	Gronted hole through dual tubes wi29 sacks Portland Cement Type 1 & 11

R	ADI	AN		Log of Drilling		et 1 of 5	-
Grid	tion Cell9: rdinates		535 ' 875 '		Project_McCleIlan_AFB_I Beginning	and end	٦
Grou	nd Level		_	3 ft.MSL (topo).	Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By <u>T. Walt</u>	<u>Drillsyst</u> em 1000 CSR	1/
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks	
- - -				Surface, plaster	from blow-out preventer	Drilled by the dual tube air rotary method. 0.1	1 1 1
5 - - - 10	С			SILT: Brown, wit	h minor clay	0.1	T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	С			SILT: Clayey, da	ark brown	0.1	
	С			CLAY: Silty, dar becoming siltie		0.1	
- - - - 25	С			SAND: Fine-coars dark brown	se, poorly sorted,	0.1	- - - - - - - -
- - - - 3()	C			CLAY: Silty, wit stringers, cutt possible contam	ings grey-brown,	7.5	
- - - - 35	C			SILT: Clayey, ce	emented	-	
- - - - - - - -	С			SAND: Fine-mediu	im grained, micaceous	Contact, sharp	4 84 16565

Boring or Well No. RADIAN Sheet __2_ Log of Drilling Operations Project McClellan AFB IRP Phase II Location. 9:19 Grid Cell_ Beginning_ 8535' Coordinates of drilling operation 18875**'** Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operator Drillsvstem 1000 CSR/Log Recorded By T. Walters L. Holtort 53 ft.MSL (topo). Ground Level Elevation:

	Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphíc Log	Lithologic Description	Remarks	
	40	C			SILT: Yellow-brown, cemented	0.2	
-	<u>45</u> -	C			SILT: Hard (cemented) with clay, 25%	0.2	1
-	- 50 -	_			yellow-brown	0.1	1
-	- 35 -	С			SILT: Sandy, fine grained, yellow- brown, sand 25%	0.1	1
	- - 60	С			SAND: Fine grained, coffee brown, oxidized, distinct unit		
-	• • • - 65	С			CLAY: Tan-brown, very good plasticity	0.2	
	• • •	С			SAND: Silty, poorly sorted, fine- medium grained	0.2	- - - - -
		С			CLAY: Grey, good plasticity	0.1	1-1-1-1
	- 75 - -	С			No sample		

R	ADIA	AN		Log of Drilling	Operations Bor	ing or Well No RB-4 et 3 of 5	
Grid	tion Cell dinates	X	8535 ' 8875'		Project McClellan AFB I Beginning Sampling Interval (Estimate	of drilling operat	ion
Grou	nd Level	. Elevat	ion: _5	53 ft.MSL (topo).	The Daill Die and Oncore	Drillsystem .000	CSR
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic	Litholog	gic Description	Remarks	•
80	С			CLAY: Brown, go	od plasticity	0.1	
-85 - - - 90	С			Same as above		0.3	
- - - - - - 95	С			CLAY: Silty, da	rk brown, silt 25%	0.3	
- - - - 100	С				um grained, micaceous, quartz subangular	0.2 Water sample at 98 pH = 9.5 Conductivity = 300 Temperature = 23°	。
- - - - 105	С				el, gravel poorly ular, clay very plastic d	0.1	
- - - - 110	С				se sand, silt 106', and, subangular, poorly	0.4	1 1 1
- - - - 115	С			CLAY: Dark brow	n, very good plasticity	2.0	
120	C			CLAY: Silty, br	own, sand stringer 119'	1.1	4 84 16 5 6

Log of Drilling Operations

Boring o	121 13	O RB-	4
Sheet	•	fc	ò

Location			Project McClellan AFB IMP Phase I	•
Grid Cell	9:19		Beginning	and end
Coordinates	x 8535'			ing operation
	y <u>18875</u>		Sampling Interval (Estimated) Composi	_
		52	. Type Drill Rig and Operator Drillsyst	

Ground Level Elevation: 53 ft.MSL (topo). Type Drill Rig and Operator Drillsystem 1000 CSR Log Recorded By 1. Walters 1... H. It rt

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
120	С			SAND: Clayey, clay 15%, interbedded	0.1
- - - 130	С			No sample	
_ _ _ _ _ _ 135	С			CLAY: Silty, light brown, fair plasticity	
-140	С			SAND: Silty with minor clay, water- bearing	0.0 Water sample ±10gpm pH 9.0 Conductivity-210 Temperature-19°C
145	С			SAND: Coarse, with clay, clay 25%, sand poorly sorted	0.0
150	С			SAND: Coarse, with minor clay, sand, poorly sorted, clay zone fairly confining	0.0
- 155	С			SAND: Clayey, interbedded, sand is water-bearing, clay confining, sand stringer 153'-154', confining clay 155'	0.0 Lost circulation 1544
160	C			SAND: Fine-medium grained, some clay not plastic, making water	0.0 Water sample-V. Muddy pH = 7.8 Conductivity = 200 Temperature = 18°C

R	ADI	AN		Log of Drilling	Ch -	ng 3. Well No. <u>RB-4</u> et5of5				
Grid Coor	Location									
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks				
160 - - - 165	С				, quartz, clear-yellow, ained, subrounded	0.0 Major aquifer ±100 — gpm				
_ _ _ 170	С			Same as above		0.0				
— - - — 173	С			Same as above		0.0				
_ _ _ 180	С			Same as above		0.0				
_ _ _ 185	C				interbedded, clay , sand, fine-medium	0.0				
_ _ _ _ 19(C			each, clay brow	increase in clay 50% wn, plastic, sand fine- , coarse sand 190'	0.0 Lost circulation 1874				
- - - - 191	C			SAND with CLAY: clay yellow-brown sand and CLAY	Sand 80%, Clay 20%, own	0.0 100 gpm Water sample piH = 7.5 Conductivity = 210 Temperature = 18°C Grout note through dual tubes w				
200	C			Total Depth: 200	0 Feet	dual tubes w sieks Portland demend 2 Type 1 & 11				

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Boring or Well No. RB-5 Sheet Log of Drilling Operations Project McClellan AFB IPP Phase II Location_ 9,18 8-10-84 Grid Cell_ Beginning_ and end Coordinates 8-11-84 8500 of drilling operation 17900 Sampling Interval (Estimated) Composite 5 Type Drill Rig and OperatorDrillsvstem 1000 CSR/ Ground Level Elevation: 57 ft.MSL (topo). Log Recorded By T. Walters ID No. of Sample Taken Lithologic Description Remarks Drilled by the dual tube air rotary method. Surface plaster, from blow-out preventer 5 С 0.2 SILT: Unconsolidated, tan-brown 10 С CLAY: Silty, tan, silt fine grain 0.2 - 15 C 0.3 SILT: Sandy, poorly sorted, brown, with stringers of clay 20 С SILT: Sandy, poorly sorted, brown, 0.4 sand is fine-medium grained 25% 25 0.4 CLAY: Silty, good plasticity, clay Injecting H2O, losing circulation balling up, silt 25% 30 C CLAY: Silty, brown, silt 25%, inter-0.4 bedded . 35

CLAY: Silty, brown, silt 25%, same as

above

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84 16566

R	ADIA	AM		Log of Drilling	Ch.	ring or Well No. RB-5 eet 2 of 6	-
Grid		x			Project <u>McClellan AFB 1</u> Beginning Sampling Interval (Estimat	and endand end of drilling operation	n
Grou	nd Level	Elevat	ion: 57	ft.MSL (topo).	Type Drill Rig and Operato	rDrillsystem 1000 CSF	₹/
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
40 - - 45	С			CLAY: Silty, sam	ne as above, silt 25%, nward	0.3	
- - - 50	С			CLAY: Silty, sil dark brown, goo	lt brown, 25% clay, od plasticity	0.3 Very slow drilling	
- - - - - - - 55	С			SAND: Silty, poo brown, fine-med	orly sorted, yellow- lium grained	0.3	
60	С				ch minor sand, poorly nterbedded with clay	0.3	
- - - - - - 65	С			SILT: Yellow-bro	own, no clay visible	0.3	
70	С			SILT: Same as ab	pove, with trace clay,	0.2	
- - - 75	C			CLAY: Silty, bro	own	0.2	
- 80	С			SAND: Micaceous moderately sor	, fine-medium grained, ted, moist	0.2 Dropped waterline, dry	

R	ADIA	AN		Log of Drilling		Boring or Well No. $RB-5$ Sheet 3 of 6	
Grid		x			Project McClellan AF Beginning	TB IPP Phase IIand oof drilling operat	end tion
Grou	nd Level			ft.MSL (topo).	Type Drill Rig and Oper	rator Drillsvstem 1000 Walters \L. Holt	CSR/
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
- 30 - -	С			CLAY: Silty, bro	wn, silt 25%	0.3	
	С			CLAY: Silty, yel	low, silt 35%	0.3	
- - - - 95	С			CLAY: Grey-brown	, good plasticity	0.3	
100	С				k grey, stained with strong odor in	pH = 6.9 Conductivity = 91 Temperature = 21°	
105	С			CLAY: Same as ab	ove	AID 17.0 ppm 0.4	-
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	C			CLAY: Silty		0.4	1 1 1
- - - - - 15	С			CLAY: Sandy		0.4	
120	C			CLAY: Silty, yel fair plasticity	low, silt 25%, clay	Water 120' pH = 7.5 75.0 Conductivity = 21 Temperature = 19°	0.0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1

83	ADI	AN			oring or Wight No. $\frac{RB-5}{of 6}$	_		
Grid	Cell				Project <u>McClellan AFB IRP Phase II</u> Beginning and end of drilling operation Sampling Interval (Estimated) <u>Composite 5</u> (ft)			
Grou	ind Leve	l Elevat	ion: 5	7 ft.MSL (topo). Type Drill Rig and Operat Log Recorded By Toward	or <u>Drillsys</u> tem 1000 C	JSR/		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
120 - - 125	С			CLAY: Silty, same as above, yellow, strong petroleum odor in cuttings	0.6			
- - - - 130	С			CLAY: Silty, yellow-brown, fair plasticity	0.1			
_ _ _ 135	С			Same as above	0.1	-		
- - - 140	С			SAND: Silty, poorly sorted, fine- medium grained, water bearing	Water sample Water 140' pH = 7.5 0.1 Conductivity = 400 Temperature = 18°C			
- - - 145 -	С			SAND: Coarse, subangular, quartz clear and yellow, Biotite 5%, lithic frag. 10%	0.1			
156	C			SAND and GRAVEL: Same as above, coarsening downward	0.1			
- - - 155	C			Same as above	0.1			
- - - - !50	C			Same as above	0.1	+ + + +		

R	ADI	AN		Log of Drilling (ring 2. Well No. RB-5 eetof6	
Grid Cooi	Cell rdinates	x y		E	Project McClellan AFB 1 Beginning Sampling Interval (Estimat	of drilling operatio ed)_Composite_5(f	n ft)
Grou	nd Level	Elevat	ion:	57 ft.MSL (topo).	Type Drill Rig and Operato Log Recorded By <u>T. Wall</u>	turs L. Holtor	rK/
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic	Description	Remarks	
100 - - - - - - - -	С			CLAY: Silty, confi	ining, fair plasticity	0.5	-
	С			CLAY: Silty, with bedded, silt 20%	minor sand, inter- , sand 10%	±10 gpm 0.5	
- - - - 173	С			SANJ: Medium grain clay 10%	ned, with clay, brown		
- - - 130	С			SAND: Medium-coars sorted with clay: fragments 10%	e grained, poorly matrix, 10%. Lithic	Sieve = silt Water sample 0.5 pH 7.8 Conductivity = 210 Temperature = 18°C	
- - - - 185	С			CLAY: Yellow, con-		0.3	
- - - - - -190	C			Same as above. Coa increase in silt		0.4	1 1 1
- - - - 195	С			CLAY: Sandy, light	t brown	0.3 Water sample Good contact 195' pH = 8.9 Conductivity = 300	
- - - - 200	c				rlv sorfed, micaceous quartz clean, sub~	Temperature = 18°C = 0.3	1 1 1 1

R	ADI	AN		Log of Drilling	Operations	Boring or Well No. RB-5 Sheet 6 of 6
Grid						and endand endof drilling operation
Crou	nd Level			ft.MSL (topo).	Sampling Interval (E: Type Drill Rig and O	stimated) Composite 5 (ft) perator Drillsystem 1000 CSR; Walters \L. Holtort
Depth (ft)	lvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
200 - - - - 205	С			SAND: Course gra same as above	ained, poorly sorte	ed, =150 gpm 0.3
- - - - - 210	С			CLAY: Yellow bro plasticity, out Total Depth - 21		0.3 Grout hole through dual tubes with 35 sacks Portland Type I-II cement.
- - -	С		 			
- - -	С					
- - - -	С					
- - - -	C					
- - -	С					
- - -	()					

RADIAN

Log of Drilling Operations

Boring or Well No. RB-6 Sheet 1 of 6 Sheet

Location					
Grid Cell		9. 18	_	_	
Coordinates	Х	8375			
	у.	17375			_

Project McClellan AFB IRP Phase II 8-9-84 Beginning_ and end 8-9-84 of drilling operation Sampling Interval (Estimated) Composite 5

Type Drill Rig and Operator<u>Drillsyst</u>em 1000 CSR/ Ground Level Elevation: 57 ft.MSL (topo).

Log Recorded By T. Walters

F					
Depth (ft)	Tvpe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
5	С			SOIL: Unconsolidated	Drilled by the dual tube air rotary method.
10	С			CALICHE: White, with topsoil	0.5
-	С			SAND: Silty, brown, poorly sorted	0.5
15 	С			SAND: Silty, loosely consolidated,	0.5
20	С			poorly sorted, medium - coarse grained, moist, fining downward SAND: Silty, light brown, fine	0.5
25	C			grained, fining downward	0.5
30	-			SAND: Silty, dark brown, very fine	0.5
35	C			SAND: Silty, fine-medium grained, mod- well sorted	0.6
_	С			SAND: Silty, poorly sorted	-

R	ADIA	2N		Log of Drilling	0	ng or Well No. <u>R8-6</u> et <u>2</u> of <u>6</u>	
Grid		×			Project McClellan AFB In Beginning Sampling Interval (Estimate	and eand eand e	ion
Grou	nd Level	l Elevat	io n: 57	ft.MSL (topo).	Type Drill Rig and Operator	<u>Drillsyst</u> em 1000 C	SR/
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphie Log	Litholog	gic Description	Remarks	
40	. C			SAND: Poorly sorted, fine-medium grained, brown		0.6	
— + , ,	С			SAND: Fine-medion to yellow silt	um grained, grading down , 46-50 fining downward	0.5	-
50 - - -	С			-	xtremely fine "flour"	0.5	++++
- 55 - -				texture	ightly moist, "flour"	0.5	
- - 60 	С			CLAY: Silty, Si	ightly moist, flour	0.5	1
- - - - - - - - 5	С			CLAY: Silty, re than above uni	d-brown, more oxidized t	0.5	1
- - - 70)	C			CLAY: Red, silt	y, same as above	0.5	1
- - -	C			SILT: Tan, simi above 46-50	ilar to silt from		1 1 1
- 30	c			SILT: Dark brow stringers	wn, cemented, with clay	0.5	-

R	ADIA PORATION	AN		Log of Drilling	g Operations	Boring or Well No. RB-6 Sheet 3 of 6	
Grid		x			Project McClellan AFB IPP Phase II Beginning and end of drilling operation Sampling Interval (Estimated) Composite 5 (ft)		
Grou	nd Level			ft.MSL (topo).	# D.W.D: 10	erator Drillsystem 1000 CSR. Walters L. doltort	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
- ⁸⁰ 	С			CLAY: Dark brow slightly moist	n, fairly plastic,	0.6	
	С			SILT and CLAY:	Mixed, yellow	0.6	
- - - - 95	С			CLAY: Sandy, sa clay is confin	nd is water-bearing, ing	, 0.6	
- - - 100	С				ater at 95', sand ained, clay red-brow	Water sample - Water 95' - Whater 95' - What	
- - - 105	С			CLAY: Yellow, v	ery good plasticity,	, 0.6	
 	C			CLAY: Yellow, s	ame as above	0.6	
— 110 - - - - - :15	C,			CLAY: Yellow, g 114'-115'	rading to sandy clay	y	
- - - - 120	С			CLAY: Silty, br	own	Lost virgulation =	

R	ADIA	AN		Log of Drilling Operations Bor	ing or Well No. RB-6 eetot6			
Grid		×		Project McClellan AFB I Beginning	Project_McClellan AFB_IBD_Phase_II Beginningand end of drilling operation Sampling Interval (Estimated)_Composite(ft)			
Oreu	nd Level	l Elevat	ion: 5	7 ft.MSL (topo). Type Drill Rig and Operator Log Recorded By The Market	Drillsystem .)00 CSR.			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
120	С			CLAY and SAND: Interbedded, poorly sorted, sand producing ±10 gpm	0.4			
125 - -	С			CLAY: Yellow, silty, poor plasticity	0.4			
- 					0.4			
- - 135 -	C			SAND and GRAVEL: Coarse grained, poorly sorted, subangular quartz	0.4			
- - 140 -	С			GRAVEL: Poorly sorted, subangular quartz, lithic 10%	Water sample pH = 7.9 Conductivity = 300 Temperature = 18°C			
- - 145 	С			SAND: Coarse, dark brown, micaceous, poorly sorted	0.3			
- - - 	С			SAND and GRAVEL: Poorly sorted, lithic fragments 10-15%, quartz clear, yellow				
- - - - -153	С			CLAY: Grey, confining, sharp contact with above unit	0.3			
- - - 160	С			SAND: Brown, fine-medium grained with clay matrix, muddy	0.3			

R	ADIA PORATION	an		Log of Drilling		oring 5. Well No. RB-6 neet 5 of 6	-			
Grid		x			Project McClellan AFB IND Phase II Beginning and end of drilling operation					
Grou	Sampling Interval (Estimated) Composite 5 (ft) Ground Level Elevation: 57 ft.MSL (topo). Type Drill Rig and Operator Drillsystem 1000 CSR/Log Recorded By T. Walters L. Holtort									
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks				
160 - - -	С			CLAY: Silty, br	own, fair plasticity	0.3 ±25 gpm	7			
165 - - -	С				, fine-medium grained, ted with oxidized	0.1	7777			
─170 - - - - - -175	С			water SAND: Micaceous unit, highly o	, finer than above xidized	0.3				
- - - 180	С			CLAY: Yellow, f	air plasticity	0.3 Water sample pH = 9.0 Conductivity = 200 Temperature = 19°C				
- - - 185	С			CLAY: Yellow-gr of water	ey, confining, out	0.3				
- - - - 190	Ç			SAND: Fine-medi matrix	um, muddy, 25% clay	0.3	1111			
- - - - 195	C			CLAY: Yellow, c	onfining, out of water	ст10 кbш				
- - - - 200	(;			SAND: Coarse, p coarse grained	oorly sorted, fine-	Water sample pH = 9.8 0.8 Conductivity = 210 Femperature = 18°C				

R	ADIA	AN		Log of Drilling	Operations	Boring or Well No. RB-6 Sheet 6 of 6	
Grid Coor	Cell dinates	x		of ft.MSL (topo).	Project_McClellan_AFB_IRP_Phase_II Beginningand endof drilling operation Sampling Interval (Estimated) Commosite 5 (ft) Type Drill Rig and OperatorDrillsystem 1000_CSR,		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	Log Recorded By T.	Remarks	
200 - - - - - 205	С				m grained, poorly clear, lithics 10%	0.3 ±100 gpm	
210	С			CLAY: Yellow, wi sand Total Depth - 210	th stringers of fin	0.3 Grout hole through — dual tubes using — Ready-Mix cement — truck and Portland — type I-II cement.	
				Total Depth:	210 teet		

R	ADIA	3N		Log of Drilling (Soring or Well No. RB-7 Sheet 1 of 3			
LocationGrid CellCoordinates		9, 17 x 8635 y 16,810 1 Elevation: 55 ft.MSL (topo).			Project McClellan AF3 IRP Phase II Beginning 5 August 1984 and end 6 August 1984 of drilling operation Sampling Interval (Estimated) Composite 5 (ft) Type Drill Rig and OperatorDrillsystem 1000 CSR/ Log Recorded By T. Walters L. Heltort			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologi	c Description	Remarks		
- - - - 5	С			SILT; light brown	, w/2' topsoil.	Drilled by the dual tube air rotary method.		
- - - 10	C			SILT; light brown solidated rock from	, moist, some uncon- agments.	0.2		
- - - 15	С			SAND; poorly sort dated, 10% lithic	ed, loosely consoli- fragments.	0.2		
20	С			SAND; silty with brown, moderately	gray clay galls, lt. sorted.	0.1		
<u>-</u> - - - - 25	С			CLAY; silty, with brown, clay 75%,	stringers of sand, sand 25%.	0.1		
				CLAY; silty, trc. clay with depth.	sand becoming sandy	0.0		
				Increase sand 30-	35'.	0.0		
_				CLAY; sandv, dark	brown, sand poorly	0.0		

sorted, clay red-brown.

R	ADIA	AN.		Log of Drilling Operations Born	Boring or Well No. RB-7 Sheet 2 of 3			
Coordinates x 8635 y 16,810 Ground Level Elevation:			10	Project McClellan AFB II Beginning 5 August 19 6 August 1984 Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By T. Walte	of drilling operation of Commosite 5 (ft) Orillsystem 1000 CSR/			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
- 4 0	С			CLAY; tan, slightly moist very little sand, fine grained.	0.2			
+ 1	С			SAND; very well sorted, well rounded, brown, quartz 70% lithics 30%.	0.2			
50	С			SAND; clayey, interbedded, clay 55-56'; sand 56-60' clay dark brown, fair plasticity.	0.4			
	С			CLAY; red silty, fining downward.	0.2			
 - - -	С			CLAY; light tan, good plasticity, gummy, very little sand.	0.8			
65	С			CLAY; tan, fair plasticity, trace sand, fine grained.	0.8			
7.5	С			SAND; silty, brown, with silt 35%, clay 10%.	0.8			
	С			CLAY; brown silty, silt 20%, clay 80%.	0.8			

1-1

R	ADIA	AN		Log of Drilling		ring or Well No eet <u>3</u> of <u>5</u>				
Grid	celldinates	9, 17 x 863 y 16,	5		Project McClellan AFB 1 Beginning 5 August 19 6 August 1984 Sampling Interval (Estimat	84 and e	ion			
Grou	Ground Level Elevation:55 ft.MSL (topo). Type Drill Rig and Operator Drillsystem 1000 CSR, Log Recorded ByT. WaltersL. Holtort									
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks				
80 - - - -	С			CLAY; brown silty plasticity.	silt 15%, clay poor	0.8				
95 90	С			CLAY; silty, silt	: 30%, fine-grained.	0.1 Slow drilling.				
- - - - - 95	С			CLAY; same as abo stringer 94-95'.	ove, with silt	0.1	1			
_ _ _ 100	С			SILT; light-brown water-bearing.	ı, with clay clasts	0.1 Water sample Depth to water SC 400 Temp 20° pH 6.8	78:			
- - - 105	С			CLAY; brown, conf	ining, no cuttings	0.1 Lost circulation.	1			
- - - - -	Ç			CLAY; tan-yellow, surface seal.	plugged bit lost	0.1				
- - - - - -115	Ç			CLAY; yellow- tro	. silt, fine-grained.					
- - - 120	Ü			SAND; fine-med. g stringers, brown.		0.1	484 10746			

R	ADIA	AN		Log of Drilling Operations Boring or Well Mo. RB-7 Sheetof				
Grid Coor	cell 9 dinates	x 80 y 10	635	Sampling Interval (Estimate	of drilling operation ed) Composite 5 (ft)			
Depth (ft)	Type of Sample Taken	Sample Taken	Graphic Log	ft.MSL (topo). Type Drill Rig and Operator Log Recorded By <u>F. Walts</u> Lithologic Description				
120 - - - - 125	С			SAND; fine-med. grained, micaceous, moderately sorted, oxidized.	0.1			
- 130 130	С			SAND; fine-grained, gray-brown, with clay, clay 25%, sand 75%.	0.0			
- - - - - 135	С			SAND; brown, oxidized, poorly sorted, with minor clay.	0.0			
- - - - 1+0	С			CLAY; tan, confining with trace silt.	0.0 Lost circulation water sample pH 7.0 Cond. 410			
- - - - 145	С		XXXX	SAND; silty with stringers of red clay. GRAVEL; 144'.	Temp. 18°C			
- - - - - 150	С			CLAY; sandy, no return.	0.0			
- - - - 135	С		•••••	SAND; coarse, poorly sorted, brown, cemented.	0.0			
_ _ _ 	(;			GRAVEL; with sand, very poorly sorted, water bearing.	Sieve analy- sis = sand Water sample pH 8.5 0.0 Cond. 400			

R	ADI	AN		Log of Drilling		ng :: Well No. RB-7 et5of5	
Grid Coor	dinates	9, 17 x 86; y 16 Elevat	810	55 ft.MSL (topo).	Project McClellan AFB IPP Phase II Beginning 5 August 1984 and end 6 August 1984 of drilling operation Sampling Interval (Estimated) Composite 5 (ft) Type Drill Rig and Operator Drillsystem 1000 CSR/ Log Recorded By T. Walters L. Holtort		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
160 - - - - 165	С			Lost Circulation	160'.	0.0 - TD 165'.	
	С						
- - - - 173	C						
- - - 130	C						
- - - - 181	C						
_ - - 	C						
19	C					Grout hale through -	
- - - - -	C			Total Depth: 1	65 Feet	dual tubes w 75 — sacks Portland Cement Type 1 s 11	

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RADIAN Log of Drilling Operations Boring or Well No. RB-8 Sheet I of 6								
Grid Coo	ation6 Cell6 rdinates . Elevat	x 588 y 16,	80 500	Beginning 30 July 31 July1 Sampling Interval (Estimate	Sampling Interval (Estimated) 5 (ft) Type Drill Rig and Operator Dual tube rotary			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
	G			TOPSOIL	ovm(ppm)	7-1-1		
5	С			SAND; silty, fine-grained, dry, tan.	0.7			
_ _ _ 15	С			SAND; similar to above with traces of fine gravel.	0.7	1		
- - - 20	С			SAND; as above.	2.5 (unstable)	1 1 1		
- - - - 25	С			SAND; similar to above, coarsening with depth.				
- - - - - 30	C			GRAVEL; fine-grained with some fine sand and silt, slightly damp, tan.				
- - - - 35	С			SILT; with some fine sand; slightly damp, tan.		1		
- - - 40	С			SILT; as above.		4 84 16/66		

_									
Log of Drilling Operations Boring or Wel: No. RB-8 Sheet 2 of 6									
Grid Coor	dinates	y 1	5880 6,500 53 ft	, msl (topo.)	g	1984 and end 984 of drilling operation d) 5 (ft) Dual tube rotary			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks			
+0 - - - - - 45	С			SILT; as above.		ovm (ppm) -			
- - - - 50	С		35555	SAND; fine-grai slightly damp,	ned with some silt; tan.	- - -			
- - - 55	С			SILT; sandy, fi damp, tan.	ne-grained; slightly				
_ _ 60	С			SILT; similar t fine gravel.	o above with minor	- - - -			
- - - - - - -	С			SILT; as above.		27 (meter very unstable; battery low; discontinued measurements)			
70	С			SAND; fine-graidamp, tan.	ined, siltv; slightly	- - - -			
-	ϵ			SAND; similar (gravel and clay	to above with trace fine	Thin clay stringer _ at 73.0-73.5'.			

CLAY; sandy, with minor fine gravel;

sticky, plastic, wet. tan.

C

84 16,00

R	ADI/ PORATION	AN		Log of Drillin	ng Operations	Bori She	ng or Well No. $\frac{RB-8}{\text{of } 6}$
Grid Coor	dinates	y 16,	500	t, msl (topo.)	31 July Sampling Interval (Es	July 19 timate perator	1984 and end 84 of drilling operation d) 5 (ft Dual tube rotary
Depth (ft)	lype of Sample Taken	ID No. of Sample Taken	Graphic Log	Litho	logic Description		Remarks
80 - - - 85 - - - - 90	С			SAND; fine-grai slightly damp, SAND; similar t		ıs;	_

SAND; coarse-grained with minor fine С gravel; damp. SAND; medium to coarse-grained, moder-С RB-8-1 (100') ately sorted, damp. $T = 25^{\circ}C$ pH = 6100 RB-8-1 C = 200 LmhosSILT; clayey; water-bearing, yellow-C brown. 105 C SILT; as above. -l10] C SILT; similar to above, increasing clay with depth. -115 C SILT; as above. Lost circulation 120

4 84 16566

R	ADI	AN		Log of Drilling Operations Bor She	ong or Well No. $\frac{RB-8}{6}$ eet $\frac{4}{6}$ of $\frac{6}{6}$		
Grid	ation Cell rdinates		380 ,500	Beginning 30 July 31 July 1 Sampling Interval (Estimate	Project McClellan Phase II Beginning 30 July 1984 and end 31 July 1984 of drilling operation Sampling Interval (Estimated) 5 (ft)		
G.L.	Elevat	ion	<u>53</u> f	t, msl (topo.) Type Drill Rig and Operato Log Recorded By D.Richm			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic	Lithologic Description	Remarks		
120					OVM (ppm)		
_ 125	С			SAND: silty, moderately sorted; slightly damp, tan to brown.	0.04		
130	С			SAND; similar to above; wet.	0.0		
135	С			SAND: as above.	RB-8-2 (140')		
- - <u>1</u> 40	С	RB-8-2		SILT; with some clay; saturated, tan to brown.	pH = 8 C = 200 umhos		
- - - ! 45	С			CLAY; hard, dry to slightly damp, tan to brown.			
- - - - i >0	С			SAND; medium to coarse-grained, water-bearing, brown.			
- - - 155	C			SAND; as above.	RB-8-3 (160') T = 18°C		
- - - - - [60	С			SAND; as above.	$\begin{cases} 1 = 10 & C \\ pH = 7.2 \\ C = 210 & mhos \end{cases}$		

R	ADIA	AN	-	Log of Drilling		eet 5 of 2	
Grid	tion Cell dinates		380		Project McClellan Phase II Beginning 30 July 1984 and end 31 July 1984 of drilling operation Sampling Interval (Estimated) 5 (ft)		
G.L.	. Elevat	ion	53 f	t, msl (topo.)	Type Drill Rig and Operator Log Recorded By D. Richman		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
160 - - - 165	С	RB-8-3		SAND; as above.		OVM (ppm) 0.2	
- - - 170	C			SAND; similar to grained.	above, slightly finer-		
- - - - :73	C			SAND; fine to me silt; water-bear	dium-grained; minor ing,brown.	0.017	
_ _ 180	C			CLAY; some sand; brown.	plastic, saturated,		
_ _ _ _ _ _ _ _ 135	С			SAND; coarse-gra highly productiv	ined, some fine gravel; e aquifer.		
_ _ _ 190	C			SAND; as above.			
 195	С			SAND; as above.			
_ _ _ _ 200	C			SAND; as above.		RB-8-4 (200*) T = 17°C pH = 7.6 C = 215 .mhos = 38	

RADIAN Log of Drilling Operations							Boring or Well No Sheet 6 of 6	
Grid	tion Cell dinates	y <u>16</u>	5880		Project McClellan Phase 11 Beginning 30 July 17-, and end 31 July 1984 of drilling operation Sampling Interval (Estimated) ,tt) Type Drill Rig and Operator Dual 1 feet 1 st.			
G.L.	. Elevat	ion 5	3 f	t, msl (topo.)	Log Recorded By 1	Operator <u>.</u> D.Richmann	T.Walters	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description		Remarks	
200 - - - - - 205	С	RB-8-4		SAND; as above.			Lost circulation	
- - - - 210	С			SAND; as above.			- - - -	
- - - - 215	С			SAND; as above.			- - -	
- - 220 - - -					ined, with some of high production		TD = 220' Hole grouted with Portland Type I-II neat cement. Cement delivered through drill	
225 230 							stem from bottom of hole up to surface.	
							- - -	

				Bor	ing or Well No. RB-9
R	ADIA	AN			et1of _5
Grid	ition Cell dinates	9, 15 x 8240)	Project McClellan Phase Beginning 8 August 9 August 1	11 1984 and end 984 of drilling operation
G.L	. Elevat	y <u>14.7</u> 9		Sampling Interval (Estimate Type Drill Rig and Operato Log Recorded By D. Richm	ed) 5 (ft) r Dual tube rotary
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
_					OVM (ppm)
-	G			TOPSOIL.	
5	С			CLAY; silty; slightly damp, brown.	0.0
15	С			CLAY; as above to approx. 13'; well sorted, tan silt below; damp.	0.0
20	С			SILT; well sorted with minor clay; slightly damp, tan.	0.0
25	С			SILT; well sorted, slightly damp, red- brown.	0.0
30	С			SILT; similar to above; clay increasing with depth.	().()

SILT; clavey; slightly damp, brown.

SILT; as above.

0.0

0.0

C

C

COR	ADIA	N		Log of Drilling Operations Shee	ng or Well No. RB-9 et 2 of 5
Gria Coor	tion Cell9 dinates Elevati	x <u>824</u> y <u>14</u> ,7	90	Project McClellan Phase Beginning 8 August 9 August 1 Sampling Interval (Estimated Type Drill Rig and Operator Log Recorded By D.Richman	1984 and end 984 of drilling operation d) 5 (ft) Dual tube rotary
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
40 	С			SILT; clayey, similar to above, but red-brown.	OVM (ppm) 0.0
	С			SILT; with minor clay; slightly damp; red-brown.	0.0
- - - - - 55	С			SILT; similar to above, but light tan.	0.0 Injected water.
60	С			CLAY; silty, red-brown.	0.0
- - - - 65	С			CLAY; as above.	0.0
- - - 70	С			CLAY; as above to 68'; then changes color to light tan.	0.0
75	С			CLAY; as above to approx. 74'; then silty fine sand, slightly damp.	0.0

CLAY; plastic, drv; gray-brown.

0.0

Injected water.

С

R	ADIA	/N			et3of5
Location					1984 and end 284 of drilling operation 280 5 (ft) 2 Dual tube rotary
Depth (ft)	lype of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
85 - 85	С			SAND; fine-grained with some silt; slightly damp, brown.	OVM (ppm)
- - - - 90	С			CLAY; silty, moderately plastic; damp, brown.	0.0
— — — — 95	С			SILT; with clay content increasing with depth; slightly damp; brown.	0.0
_ _ 100	C	RB-9-1		SAND; fine-grained, silty, minor clay; moist to saturated at base; brown.	RB-9-1 (100') T = 23°C
<u>-</u> - - 105	С			SAND; clayey, water-bearing to approx. 103'; silty; moist - 103-105'; brown.	pH = 8.2 C = 300 ::mhos
- - - - -110	С			CLAY; silty; moist, brown.	0.0
	С			CLAY; as above.	-

CLAY; silty; moist, red-brown to approx. ().() 118'; 118-120' - silt; well sorted; moist; light brown.

C

120

RB-9-2

R	ADI	AN		Log of Drilling Operations Bor She	or Well No. $\frac{RB-9}{1}$ et $\frac{4}{3}$ of $\frac{5}{3}$
Grid	ction Cellc dinates	9. 15	240	Project McClellan Phase Beginning 1	1984 and end 984 of drilling operation
vi.1.	Elevat	ion		Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By D.Richm	Dual Tube Retary
Depth (ft)	Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks OVM (ppm)
120 - - - 125	С			SAND; coarse-grained with silt matrix, poorly sorted; saturated to approx. 127'; brown.	0.0 RB-9-2 (120') T = 21°C pH = 6.2 C = 26mhos
- - - 1 30	С			CLAY; sandy, plastic; moist; brown.	0.0
135	С			CLAY; silty, moist, brown to approx. 132', silt, well-sorted, dry, tan from 132-135.	0.0
- - - 1 40	С			SAND; fine-grained; with some silt; moderately sorted; drv, tan to approx. 138'; clayey silt; damp, tan to base of interval.	0.0
<u>-</u> -	С			SAND; coarse-grained in clay matrix; poorly sorted; water-bearing, brown.	0.0
145 - - - 150	С			SAND; as above.	RB-9-3 (160*) T = 21°C pH = 6.4 C = 240mhos
- - -	С			SAND; as above.	0.0

SAND; as above.

C

RB-9-3

0.0

R	ADI	AN		Log of Drilling Operations Born	ng or Well No. $\frac{RB-9}{2}$ et $\frac{5}{2}$ of $\frac{5}{2}$
Grid Coor	dinates	9, 1 x 8240 y 14,70	Sampling Interval (Estimate Type Drill Rig and Operator	1984 and end 4 of drilling operation d) 5 (ft) Dual Tube Rotary	
(0.1)	. Elevat			t, msl (topo.) Log Recorded By D.Richma	nn
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160 - -					OVM (ppm)
- - 165	С			CLAY; plastic, very moist, brown.	0.0
- - - - - -	С			SAND; coarse-grained in clay matrix; poorly sorted; water-bearing; brown.	0.0
- - - 173	C			SAND; as above.	0.0
- - - - - - -	С			SAND; as above.	0.0 Lost circulation at 180'. RB-9-4 (180') T = 20°C
— 185	С			SAND; as above.	pH = 6.8 C = 235mhos
- - - - - -	С			SAND; as above; thin red-brown, plastic clay lens, approx. 187-188.5'.	0.0 Hole grouted with
- -	(;			SAND; as above; plastic clay laver approx. 193.5-195'.	Portland Type I-II neat cement. Cement delivered through drill stem from bottom of

SAND; similar to above, becoming better sorted and finer-grained with depth;

198'-200' medium sand; clean, saturated.

C

4 16566

from bottom of hole up to surface

 $TD = 200^{\circ}.$

 α . α

R	ADIA	Log of Drilling Operations Born	ng or Weil No. RB-10 etof/		
Grid Coor	ition Cell6, dinates	x <u>58</u> y <u>14</u>	.625	Project McClellan AFB TI Beginning 13 July 198 1 August 1984 Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By T. Walta	and end of drilling operation of <u>Commonite</u> (ft) orillsuster 1960 CCE
Depth (ft)	lype of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
1 1 1 1	G			TOPSOIL, unconsolidated tan-brown, poorly sorted.	Drilled by the law. tube air roting method.
10	C			SAND; unconsolidated, mod. well sorted, damp from creek nearby.	0.0 Injected water 10' -
- -	e'			CLAY and SILT; with minor clay clasts light-dark brown, clay 25%.	0.0
15	С			SAND; CLAYEY 25% clay; tan, sand is coarse, unconsolidated.	0.0
2.5	С			Same as above.	1.0
	С			SAND; silty, fine-coarse grained poorly sorted, coffee brown, uncon.	0.0
35	С			SAND and GRAVEL; poorly sorted coffeebrown.	0.0
-	С			SAND; silty very well sorted, micaceous	- - 5 0.0 -

low energy fluvial system.

3

R	ADIA	AN		Log of Drilling	^ .	ring or Weil No. RB-10 eetof3
Grid Coor	ation Cell rdinates		.625	3 ft. MSL (topo).	Project McClellan APP I Beginning 13 July 19 1 August 1984 Sampling Interval (Estimate Type Drill Rig and Operato Log Recorded By F. Ward	of drilling operation ed) <u>Commosite 5</u> (ft) r <u>Drillsyst</u> em 1000 (SK/
Depth (ft)	lyne ot Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
→t) 	С				ed micaceous, modera- ed, silt matrix 20%,	0.2
- - - - 50	С			SAND and CLAY; in fine grained, well	nterbedded, brick red, ll sorted.	0.2
- - - - 35	С				20% lithic fragments, rounded quartz grains,	0.2
- - - - 50	С				e-medium grained, mica- artz 70%, lithic frag.	0.3
- - - - - -	С			SILT; eolian, ext yellow, slightly	rremely well sorted, moist.	0.2
- - - 	C			CLAY; silty fiar	plasticity.	0.1
- - - 70	С			SILT; por plastic water bearing.	titv, light brown,	Water sample - Water - 78' - PH - 6.9 0.1 - Cond. 210 Temp 20'

SILT; brown, water bearing, moderately to well sorted, with 5-10° brown clay.

0.1

C

R	ADIA	1N		Log of Drilling	C1	ng or Well No.
Grid Coor	tion Cell dinates nd Level	x y	5875 14,625	3 ft. MSL (topo).	Sampling Interval (Estimate	and end of drilling operation of Composite 5 (ft) Drillsystem 1900 CSR
Depth (ft)	lyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
35	С			SILT; fine-graine of clay l' thick.	ed, brown, some stringer	0.1
- - - - -	С				e grained, poorly subangular, water-	Water sample Temp. 19°C pH - 7.0 Water 98' ± 5 gpm
_ _ 95	C			SAND; moderately angular.	sorted, quartz, sub-	0.1
100	С			SAND; poorly sort grained.	ed, medium to coarse	0.1
_ _ 105	С			CLAY; silty good brown.	plasticity, coffee	0.5
-11)	C				n grained, sub-angular Ly sorted, coarsening	0.1
-115	C				coarse grained poorly sangular, lithic frag-	0.1
_ _ _ _ 120	C			CLAY; silty, coff city, trace water sand.	ee-brown, poor plasti- at upper contact with	0.1

7

.

RADIAN		Log of Drilling Operations		Chant	or Well Mo. RB-10
Location			Project_McC	lellan AFB IPP	Phase II
Coordinates x 587	7.5			l August 1984	_of drilling operation
y_14. Ground Tevel Eleva		ft.YSL (topo).	Type Drill Ri	g and Operator <u>Or</u>	Composite 5

Depth (ft)	lvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
120 - -				SILT; sandy.	0.5
125	C.			CLAY; good plasticity, light brown, becoming silty clay 128-130'.	Trc. water at contact injecting water. Trc. water 128-130
-	С			CLAY; silty silt fraction increasing with depth, coarsening downward.	0.5
	С			SAND; moist. Sand moderately sorted medium to coarse grained, dropped probe, bore hole dry.	0.6
135	С			CLAY; brown, good plasticity	Water sample 1st major water bearing sand Temp. 18°C 0.5 pH 7.1 Cond. 490
143	С			SAND; poorly sorted, tan, med-coarse grained. SAND; med-coarse grained, poorly sorted, 145'-148'.	0.6
- - -	C			SAND; coarse, poorly sorted, 148'-150'.	0.5
	C			CLAY; good plasticity, tan with 10° sand interhedded, tro. water.	Water ± 5 gpm. — — — — — — — — — — — — — — — — — — —
- : 1:	C			CLAY; red, with sand stringers.	Sieve = sand ————————————————————————————————————

R	ADIA	AN.		Log of Drilling	Cha	ng _ Well No. <u>RB-10</u> et of
Grid Coor	tion Cell dinates nd_Level	1, 15 x 58 y 14	,625	43 ft.MSL (topo).	Sampling Interval (Estimated	of drilling operation d) Composite 5 (ft) Drillsystem 1000 CSR,
Depth (ft)	Fype of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
160 - - 165	C			SAND; clayey, fir poorly sorted win	ne-coarse grained, th stringers of red clay	Water <u>+</u> 5 gpm 0.6
- - - - 170	C			CLAY; sandy with tan.	white gypsum minerals,	0.6
175	Ü			SAND; cemented, may be	rusty red w/gyp. volcanic in origin.	0.6
130	C			CLAY; good plast: streaks.	icity, gray with gypsum	0.6
181	C				m grained with 5% zed, micaceous water	+ 100 gpm. 0.5
- : 10	C			SAND; medium gra quartz clear-yel	ined, moderately sorted low, highly oxidized.	0.6

SAND and CLAY; interbedded, poor plas-

CLAY, confining with sand stringers !

ticity, clay does not contain water,

sand producing + 50 gpm.

Total Depth: 200 Feet

thick, tan.

84 100.00

0.5

Great able through dual tubes w'Ready -

Type I & II

Mix Portland Cement.

0.6

						
R	ADI	NA		1 1 D 1111	— .	ng or Well No. RB-11 et 1 of _5
	PORRITOR			Log of Drilling	g Operations One	er
Loca	ition				Project McClellan Phase	II
Grid	Cell				Reginning 6 August	1984 and end
Coor	rdinates	x <u> </u>	() 3 3()		7 August 19	of drilling operation
		·			Sampling Interval (Estimate Type Drill Rig and Operator	
4	. 11.5.	13/11/	<u>f</u>	t, msl (topo.)	Log Recorded By D. Richma	
_		5 2 C				
Depth (ft)	ype of Sample Taken	ID No of Sample Taken	Graphi Log	Litholo	ogic Description	Remarks
۵	 	Sa	Gr			
_						.)[7]
_]					OVM (ppm)
_	G			TOPSOIL.		-
_ 5						
-				1		-
-	С	1		SAND: verv fine	-grained; minor clay,	0.0
				dry to slightly		-
10						_
_						-
	C			 SILT: well sort	ed; minor clay increas-	0.0
15				ing with depth;	gray brown to brown;	\ \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\
				slightly damp.		
<u>_</u>						_
_	С			SILT; same as a	bove.	0.0
- 20	}					
-	С			CTITE FILLER !	roward to allto -1	0.0
_					wnward to silty clay; gray brown to brown.]
 25						
<u> </u>	1					-
	С	}		SILT; well sort	ed; slightly damp; tan	0.0
-		ļ		to red-brown.		-
30						
-	С				y; moderately sorted;	0.0
- 35				slightly damp;	tan.	_

SAND; medium-grained, silty to approx. 36.5; red-brown, well sorted silt below

C

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RADIAN

Log of Drilling Operations

Boring or Well No. $\frac{RB-11}{5}$ Sheet $\frac{2}{5}$ of $\frac{5}{5}$

Location			Project McClellan Phase II			
Grid Cell 9	, 14		Beginning_		1984	and end
Coordinates	x	8400		7 August	1984 of drillin	ng operation
	у	13,350	 Sampling Ir	nterval (Estima		(ft)
			T 5 11 5		Flynd 1 wyd 1 .	

Type Drill Rig and Operator Dual tube rotary C.C. Elevation $\frac{52}{}$ ft, msl (topo.) Log Recorded By D.Richmann

				Log Recorded by	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
+ 0					
_					OVM (ppm)
-	С			SAND and SILT; interbedded, slightly	0.0
- - 45				damp; red-brown to gray.	
		ĺ			
_					0.0
_	С	:		SILT; very fine powder; with some clay;	Color banding suggest
-				moist; red-brown to gray-brown color-	alternating oxidized
<u>→</u> 50 ¦				banded.	and reduced zones. —
-	С	ì		SILT; with clay increasing with depth;	0.0
_		1		hard; brown.	-
 55					Injected water.
_		ļ			_
	С]
-				SAND; fine-grained with some clay and silt; poorly sorted; damp; red-brown.	_
იმ				,	
_					-
_	С			CLAY; silty, hard; brown.	0.0
				obit, Strey, hard, brown.]
 65					Injected water.
-	!				-
_ 	С			CLAY; similar to above, grading down-	(),()
	,			ward to well-sorted silt.	
;r.					
 		İ			
-					-
-	C			SILT; well sorted, gray brown to approx.	().()
<u></u>				72'; brown silty cally to base of inter- val, damp.	
L				Total damp.	
-	}				-
-	C			SILT; well sorted to approx. 77'; poorly	(),()
- 50	ł			sorted medium-grained sand below; Jamp;	-

R	ADI	N.		Log of Drilling	0.1	ring or Well No. RB-11 eet 3 of 5
Grid	tion Cell dinates	^	00		Project <u>YeClellan Phase</u> Beginning 6 August 7 August 1	1984 and end 984 of drilling operation
G.L.	Elevat	/ 		t, msl (topo.)	Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By <u>D. Rich</u>	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
ප්ට -						OVM (ppm)
- -	С				sand; minor clay near damp; gray-brown.	0.0
85	C			CLAY; silty; damī	p; brown.	0.0
- - - 95	С			CLAY; silty to volenses; damp; bro	ery plastic; minor sand own.	0.0
100	С	RB-11-1			silt; moderately sorted to well sorted silt; n.	
- - - - - - 105	С				ined, water-bearing; sorted silt, moist, .5'; brown.	RB-11-1 (100') T = 20°C pH = 6.4 C = 215 ::mhos
	С			CLAY; silty; har	d; damp; brown.	0.0
	С			CLAY; as above.		0.0
120	С			CLAY; as above t sandv clay below	o approx. 118.5';	0.0

R	ADI	AN			ing or Well No. RB-11 et 4 of 5
Grid	ition Cell dinates	9, x_ 84		Project McClellan Phase Beginning 6 August 7 August 1 Sampling Interval (Estimate Type Drill Rig and Operator	1984 and end 1984 of drilling operation ed) 5 (ft)
G.L.	Elevat	ion <u>5</u> :	2f t	. msl (topo.) Log Recorded By D.Richm	
Depth (ft)	Type of Sample Taken	Sample Taken	Graphic Log	Lithologic Description	Remarks
120 - - - - 125	С			CLAY; wet from approx. 124'-125'; brown	OVM (ppm)
	С			CLAY; as above.	0.0 Injected water.
	С			SAND; coarse grained; silty; poorly-sorted; saturated; brown.	RB-11-2 (140') T = 20°C
-	С			CLAY; hard, dry - 135'-138'. SAND; as above - 138'-140'.	pH = 6.8 C = 420 umhos -
1 4() 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	С	RB-11-2		CLAY; sandy; poorly sorted; damp; brown	0.0
145 - - - - 150	С			SAND; with some clay; poorly sorted, very moist; red-brown.	RB-11-3 (160') T = 19°C pH = 6.7 ().0 C = 425 mhos
- - - - 155	С			SAND; coarse; and fine gravel in clay matrix; poorly sorted; water-bearing, red-brown.	0.2

SAND; as above to approx. 158° ; sandy clay below.

C

R	ADI	AN		Log of Drilling	Boring or Well No. RB-11 Sheetof5			
Grid Coor	tion Cell_ dinates	x 8400 y 13,	350		Sampling Interval (Estin Type Drill Rig and Oper	st 1984 nated) ator <u>l</u>	and of drilling operat 5 Dual Tube Rotary	tion _(ft)
G.1.	. Elevat			t, msl (topo.)	Log Recorded By D.Pi.	'hmanı		=
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description		Remarks	
160 - - -	С	RB-11-3		CLAY; hard; brown	1.	I	OVM (ppm) OOO njected water.	
—165 - - - - - - 170	С				red, water-bearing to en clay, as above.		0.3	1.1.1
_ _ 	C			CLAY; hard; dry, then micaceous gr	brown to approx. 172 cavel; saturated.	·;	0.3 No Sample (interconnect	io <u>n</u>
- - - - - - - -	С			SAND; fine-graine water-bearing; br	ed; with some silt;		0.3	
- - - - - -185	С			SAND; similar to alternating with	above; micaceous, lenses of clay.		0.3	1
- - - - 	C			SAND; as above.		_	0.3	
 - - - 1/2,	C			CLAY; hard; brown	ì.	Н	D = 192'. Cole grouted with	
- - -	C.					n C	ortland Type I- eat cement. Gement delivered hrough drill ste rom bottom of he	em –

1.

1

R	ADI	AN			ring or Well No. RB-12
Loca Grid Cool	ation Cell_ rdinates	6, x 5 y 1	3,900	Project McClellan Phase	t 1984 and end 984 of drilling operation ed) 5 (ft) or Dual tube rotary
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- - - - - - 5	G			TOPSOIL.	(VM (ppm)
	С			SAND; poorly sorted; damp; brown.	
— — — — — 15	С			CLAY; some silt and fine sand; damy; brown.	
- - -	С			SILT; interbedded with hard clau; slightly damp; medium to fark brown.	
- 20 25	С			SILT; well sorted, -rading to time sand at base; slightly damp; brown to red-dish brown.	
 - -	С			SAND; fine-grained, some clay; slightly damp; brown.),)

C CLAY; silty, interbedded with silt; (1.0) — minor sand; slightly damp; brown.

RADIAN

Log of Drilling Operations

Boring or Well No $\frac{RB-12}{\text{Sheet}}$ of $\frac{5}{}$

Location			
Grid Cell		6, 14	
Coordinates	Х	5800	
	у	13,900	

Sampling Interval (Estimated) 5 (f Type Drill Rig and Operator <u>Dual tube rotary</u>

G.L. Elevation 47 ft, msl (topo.) Log Recorded By D.Richmann

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
40 - - - - 45	C	_	5	SILT; some silty fine sand; damp; brown.	OVM (ppm) 0.0
- - - - 50	С			CLAY; gray-brown; some silt and fine sand; damp; red-brown to brown.	0.0
- - - - 55	С			SILT and fine sand; damp; yellow-brown.	0.0
	С			CLAY; silty and plastic with hard clay layer near base; damp; dark brown.	0.0 Fine sand in basal 6".
- 65	C			SAND; fine-grained, silty grading to clayey; damp; brown.	0.0
- - - -	С			SAND; fine-grained; damp; brown.	().1)
70	С			SILT; well-sorted; damp; grav-brown to oxidized red-brown at approx. 72'.	0.0 Silty clay, red- brown below approx.
80	С			CLAY; silty, plastic; moist; brown.	(),()

R	ADIA	M		Log of Drilling Operations Bor She	ing or Well No. $\frac{RB-12}{\text{of } 5}$	- -
Grid (ion Cell dinates	6, x 58	14 300 3,900	Project <u>McClellan Phase</u> Beginning 3 August	1984 and er and er and er are are are are are are are are are	on
G.L.	Elevati	ion	47 £ t	type Drift Rig and Operators, msl (topo.) Log Recorded By D. Richt	nann	
Depth (ft)	ype of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks	
50 - - - - 85	C			CLAY; silty, hard; slightly damp; gray- brown.	OVM (ppm) Injected water. ().0	1
90	С			CLAY; sandy, slightly damp, brown; wet at 89'.	().() I No sample.	
95	С			SAND; fine to medium-grained; moist but not saturated; brown.	(),()	
-: 00	С	RB-12-	1	SAND; as above; trace clay; water at 98	RB-12-1 (100') T = 16°C DH = 6.8 C = 520 umhos	1-1-1-1
105	С			CLAY; hard, dry; brown.	().()	1 1 1
-	C			CLAY; silty, grading to silty fine sand slightly damp; brown.	i;	
	С			CLAY; siltv, damp; brown.	. 1	1 1 1
129	C			CLAY; as above.	0.1	4 84 16566

Γ,	001			• • • • • • • • • • • • • • • • • • • •		Boring or Well No. RB-12	
OR	PORATION	AN		Log of Drilling		Sheet of	
Location— Grid Cell 6, 14 Coordinates x 5800 y 13,900					Project McClellan Phase II Beginning 3 August 1984 and end 3 August 1984 of drilling operation Sampling Interval (Estimated) 5 (ft) Type Drill Rig and Operator Dual Tube Rotary Log Recorded By 2.414 Frams		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
120 - - -	С			CLAY; as above.		OVM (ppm) 0.0	
	С			CLAY; as above.		0.0	
	C			CLAY; as above.		0.0	
- - - - - -	C	R8-12-2		CLAY; as above;	wet at 138'.	0.0 RB-12-2 (140') T = 18°C	
 : . , ;	C			SILT; with some brown.	sand; water-bearing;	pH = 6.8 C = 265mhos	
- - - 150	C (ding to clavey silt and thy damp; alternating d-brown.	nd ().)	
-				ALT AND A SECOND			

SILT; with some clay alternating with silty clay; slightly damp; brown.

1).1)

Boring or Well No.. RADIAN Sheet ___5 _of_ Log of Drilling Operations Project McClellan Phase Location_ 3 August 6. 14 Grid Cell Beginning_ 5800 3 August Coordinates __of drilling operation 13,900 Sampling Interval (Estimated)_ Type Drill Rig and Operator <u>Dual Tube Rotary</u> 47 ..L. Elevation ft, msl (topo.) Log Recorded By D. Richmann ID No. of Sample Taken Type of Sample Taken Lithologic Description Remarks OVM (ppm) CLAY; silty, plastic; moist; light gray Injected water. C 0.0 0.0 Possible water zone CLAY; similar to above; wet. at approx. 168', but_ Ctoo thin to sample. Lithologic contact at approx. 172'. 0.02 CLAY; silty overlying clayey gravel; brown to red brown. RB-12-3 (180') $T = 19^{\circ}C$ pH = 7.3C = 310 LmhosGRAVEL; poorly sorted, clay matrix, water-bearing; red brown. RB-12-3 GRAVEL; similar to above; fining down-0.0 ward to clayey sand; poorly sorted; water-bearing; red-brown. SAND; with clay matrix; poorly sorted; moist; red-brown. 0.0

SILT; with some clay; damp; red-brown.

SILT; well sorted; slightly damp;

vellow-brown.

1

84 16566

ID = 200'.

neat cement.
Cement delivered
through drill stem

up to surface.

1.0

Hole grouted with

Portland Type I-II

from bottom of hole

R	ADI	an		Log of Drilling Operations Bore	ng or Well No. $\frac{13}{\text{of } \frac{5}{5}}$
Grid Coo	ation Cell rdinates	x y <u>1</u>	5. 14 4100 3580	8-17-84 Sampling Interval (Estimate	and end
Grau	ind Level	L Elevat	ion: <u>4</u>	ft.MSL (topo). Type Drift Rig and Operator Log Recorded By <u>W. Boett</u>	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- - - - -	С			SAND: Silty, clayey, fine to medium grain, brown	ovm (ppm)
- - - - - 10	С			SAND: Silty, fine to medium grain, brown	0.1
- - - - -15	C			CLAY: Silty, sandy, fine to very fine grain, tan	0.5
- - - - 20	С			SAND: Clayey, silty, fine to very fine grain, brown	0.3
- - - - -25	C			SAND: Clean, medium grain to fine grain, poorly sorted, tan	0.3
- - - 30	С			SAND: Silty, fine to medium grain, poorly sorted, tan	0.25
- - - - -35	C,			SAND: Silty, fine to very fine grain, tan to brown	0.15
- - -	С			CLAY: Silty, sandy, fine to very fine grain, tan	0.15

R	ADIA	an		Log of Drilling Operations Born	ng or Well No. 13
Location Grid Cell Coordinates x			Beginning 8-15-84 8-17-84	and end of drilling operation	
Crau	nd Level		10n: 45	Sampling Interval (Estimate	Dhicago Pneumatic CP200
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
40 - - - - - - - 5	С			SAND: Clayey, fine to medium grain, brown	0.4
- - - - - - - -	С			SILT: Clayey, sandy, fine to very fine grain, tan	0.2
35	С			SILT: Clayey, sandy, very fine grain, tan	0.15
	C			SILT: Clayey	0.23
	C			SAND: Silty, micaceous, fine to very fine	0.21
	('			SAND: Clayey, medium to coarse grain, plastic, dark brown	0.01
- - - -				CLAY: Silty, sandy, tine to medium grain, brown	0.02

SILT: Clayey, sandy, tan

0.01

R	ADIA	AN	-	Log of Drilling Operations	Boring or Well No. 13 Sheet of
Grid		×		Beginning <u>8-15-</u> 8-17-	184of drilling operation
Grou	ind Level			Sampling Interval (Esti Type Drill Rig and Ope Log Recorded By W. 3	mated) <u>Composite</u> (ft) erator <u>Chicago Phe</u> gmatic CP2 Soetther VG. Herst
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- - - - - - - - 85	С			SAND: Clayey, fine to medium grain, brown	0.1
- - - - - 90	C			SAND: Clayey, fine to medium, brown	0.2
- - - - 93 - -	C			SAND: Silty, clayey, cemented, brow	n 0.1 -
- - - 190	C			SAND: Fine to medium grain, brown	0.2 Water sample at 100'- ph = 5.0 Temperature = 22° Conductivity = 200
- - - 197	C			CLAY: Silty, sandy, micaceous, hard	0.15
 :	r.			SAND: Silty, medium to coarse grain	0.2
	t			SAND: Micaceous, fine to medium ara	in Water sample at 115'- pil = 5.1 Temperature = 20°C Conductivity = 220

SAND: Fine to medium grain, brown

١.:

R	ADI	an		Log of Drilling Operations Born She	Boring or Well No. 13 Sheet		
Grid		x		Beginning 8-15-84 8-17-84			
ាដ្ឋា	nd Level			Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By As Poets	Chicago Presmatic CD.		
Depth (ft)	fype of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks		
- 120 - - -	С			SAND: Clayey, silty, plastic, brown	0.25		
- - - - 136	C			SILT: Clayey, brown to tan	0.1		
- - - 135	C			CLAY: Silty, sandy, brown	0.1		
- - -)	С			SAND: Silty fine to medium grain with sparse clay clasts	0.15 Water sample at 140 pH = 5.4 Temperature = 20°C		
- - 145	С			SAND: Silty fine to medium grain, brown water	0.01		
- - - - - - -	C,			SAND: Clavey, fine to medium grain, brown, water	. 11		
- - : ; ; ; ;	ť,			SAND: Silty, medium to coarse grain, abundant water	0.12		
-				SAVD: Class medium to correspondence of			

water

R	ADIA	2N		Log of Drilling	Operations Boring or Well No		
LocationGrid CellCoordinates x							
Orou	nd Level	<u> </u>		65 MGI (5333)	Sampling Interval (Estimate Type Drill Rig and Operato Log Recorded BW. Pourt	<u>(Diference Processing is an a</u>	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	ic Description	Remarks	
;n0 - - - :n5	c			GRAVEL: Sandy, ec	parse, brown and white	0.15	
- - - - - 171	C			SAND: Medium to o	coarse	0.10	
- - - - :73	C			SAND: Medium to o FeO _x staining	coarse, cemented,	0.50	
- - - ::	C			SAND: Clayey, fir clay increasing	ne to medium grain, with depth	0.1	
- - - - -	C)			SAND: Clayey, med brown	lium to coarse grains,	0.0	
- - - - 	C.				ne to medium grain, reases with depth	:).·)	
_ - - 	t'			micaceous	ne to medium grain, lium grain, very	0.1 0.0 0-200' -2" in 16 in accordance to a	

Tral Depth: 200 Feet

RADIAN

Log of Drilling Operations

Boring or Well No. RB 14
Sheet 1 of 5

Location			 	 _
Grid Cell		6. 10		
Coordinates	Х	5100		
	v —	9700		_

Project McClellan AFB IRP Phase II

Beginning 8-27-84 and end

8-28-84 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Chicago Pneumatic CP200:

Ground Level Elevation: 45 ft.MSL (topo).

Log Recorded By W. Boettner \\ \\ \B. Herst

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- 5	С			SAND: Clayey, medium to very fine grained quartz, brown	ovm/ppm -
- - - 10	С			SAND: silty, clayey, fine to medium grained, ${\sf FeO}_{ m X}$ staining	0.0
_ _ _ _ 15	С			SAND: Silty, clayey, coarse to very fine grained, light tan	0.0
	С			SAND: Silty with clay, very fine grained, tan	0.0
	C			SAND: Clayey, fine to very fine grained, tan to brown	0.02
- - - -	C			SAND: Clavey, silty, sand, fine to very fine grained, clay, plastic	0.01
- - - 	C			SAND: Fine to very fine grained, tan to light gray	0.02
	r)			SAND: Fine to vory fine grained, tan to light brown	0.01

R	ADIA	an		Log of Drilling Operations	Boring or Well No. RB 14 Sheet $\frac{2}{-}$ of $\frac{5}{-}$		
Grid				8-28-84	Project McClellan AFB IRP Phase II Beginning 8-27-84 and end 8-28-84 of drilling operation		
Oreu	nd Level	y L Elevat	ion: 45	Sampling Interval (Estim Type Drill Rig and Opera Log Recorded By <u>W. Bo</u>	nated) Composite 5 (ft) (ft) (atofChicago Pneumatic CP2 (bettner (b. 1997st)		
(t)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks		
40 - 45	C			SAND: Clayey, silty, fine to very fing grained, tan to light brown	ne 0.01		
- 50	С			SAND: Silty, clayey, fine to very fing grained, reddish brown	ne 0.02 -		
- 55	С			SAND: Silty, clayey, fine to very fing grained, red brown	ne (),()]		
- 6 0	С			SAND: Silty, clayey, fine to very fi grained, brown to tan	ne 0.02		
65	C			SAND: Clayey, silty, fine to very fine grained, tan to brown	0.01		

SAND: Silty, clavey, very fine grained, 0.01
tan to brown

SAND: Clayev, silty, fine to very fine 0.01
grained, brown

0.02

SAND: Clayey, silty, time to very fine

grained

R	ADIA	2N		Log of Drilling Operations Born Shee	ng or Welf No. <u>RB 14</u> et3of?
Loca Grid Coor Grou	Phase II 84and endof drilling operation d) Commosite F(ft) Chicago Pneumatic CP200 ner\S. Herst				
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
30 - - - 85	С				0.0 Water sample at 80' _ pH = 5.7 Conductivity = 250 Temperature = 22°C
- - -	С			SILT: Clayey, sandy	0.0
- - - 95	C			SAND: Silty with trace of clay, fine grained, brown	0.0
100	C			SAND: Clayey, sandy, micaceous, brown	0.02
105	С			CLAY: Silty, sandy, dark brown	0.03
-11	C			SILT: Clayey, sandy, tan to gray	0.04
-	C			SAND: Clayey, silty, fine to very fine grained	0.02
_ _ _ _ 120	C			SAND: Clavev, silty, time to very fine grained, 10-15° dark grains	0.01

R	ADIA	AN			et of _5
Grid Cooi	Cell dinates	х у		Sampling Interval (Estimate	and end of drilling operation ed) Composite >(ft) rChicago Phonmatic CP20
Depth (ft)	Type of Sample Taken	ID No of Sample Taken	Graphic Log	Lithologic Description	Remarks
120	С			SAND: Clayey, silty, gravelly, dark brown	0.03 Water sample at 120'- pH = 6.0 Conductivity = 220 Temperature = 20°C
- - - 130	С			SAND: Silty, clayey, gravelly, very fine grained	0.01
	C			SAND: Silty, gravelly, clayey, brown to gray	0.02
_ 	С			SAND: Clayey, silty, brown	0.03
143	C			SAND: Clayey, coarse to medium grained	0.01
_ - - 50	C,			SAND: Gravelly, clayey, silty	0.05
	C			SAND: Gravelly, clayey	0.01
- - - :n0	C			SAND: Clay, silty, fine to very fine grained	0.02

R	ADIA	AN		Log of Drilling		etof5
Grid Coor	Cell dinates	х у	-		Project McClellan AFB I Beginning 8-27-84 8-28-84 Sampling Interval (Estimate	and end of drilling operation ed)cemposite(ft)
Crou	ınd Level	l Elevat	ion: 4	45 ft.YSL (topo).	Type Drill Rig and Operator Log Recorded BW. Route:	<u>Chicaro Pro</u> amatic CP2000 per <u>Ab</u> + 5 rst
Depth (ft)	fyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
- 160 - - - - - 165	С			SAND: Gravelly,	clean, coarse grained	0.02
— 10) - - - - - 170	С			SAND and GRAVEL:	Clean, coarse grained	0.01
- - - 175	С			SAND and GRAVEL:	Clean, coarse grained	0.02
- - - - 180	С			SAND and GRAVEL:	trace of clay	0.01
- - - - - -	С			SAND and GRAVEL:	Clayey	0.03
- - - - 	C			SAND and GRAVEL: some clay	Coarse grained,	0.01
_ - - - - 193	C.			SAND and GRAVEL: increasing clay SAND: Coarse gra		0.01 Water sample at 200 PH = 5.8 Conductivity = 240 Temperature = 22°C 0-200' 42" note Grater asie through analities & 31
- - 	(,			Total Depth: 20	00 Feet	Sacks Contlant Comess From 1 & 11

RADIAN

Log of Drilling Operations

Boring or Well No. <u>15</u> Sheet <u>1</u> of <u>5</u>

Location				
Grid Cell		9.10		
Coordinates	X	8350		
	у_	9950	-	

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Chicago Pneumatic CP2000

Ground Level Elevation: 55 ft.MSL (topo).

Log Recorded By W. Boettner \ \B. Horst

	Log Recorded By w. soetthet \ \text{b. notst}						
Depth (ft)	Type of Sample Taken	ID No. of Sampte Taken	Graphic Log	Lithologic Description	Remarks		
_					ovm(ppm)		
- - - - 5	С			SILT: Clayey, red brown	0.0		
- -	С			SILT: Clayey, tan to brown	0.04		
—10 — —	Ċ			SAND: Clayey, silty, red brown	0.06		
15 20	C			SAND: Silty, fine to very fine grained, subangular to subrounded, trace of clay	0.04		
- - - - 23	C			SAND: Clayey, medium to fined grained, angular to subangular, brown	0.08		
- - - -	t]			SAND: Clayey, silty, fine to very fine, red brown	0.02		
— — — — ——————————————————————————————	١.			SILT: Clayey, sandy, micaceous, clay content increases with depth, red brown	0.02		
- - - -	C			CLAY, Silty, sandy, micaceous, red brown	0.02		

R	ADIA PORATION	AN.		Log of Drilling Opera	Boring or Well No. 15 Sheetof		
Location Grid Cell Coordinates x y				Sampl	and end of drilling operation) Composite 5 (ft) hicago Pneumatic CP240		
Depth (ft)	vpe of Sample Taken	ID No. of Sample Taken	Graphic Log	ft.MSL (tono). Type Log Re	ecorded By <u>W. Boett</u>	Remarks	
40 - - - 45	С			CLAY: Sandy, silty, b	0.02		
- - - - 50	С			CLAY: Silty, sandy, m. somewhat plastic, re-	0.0		
- - - - - 55	С			SAND: Silty, clayey, grained, hard, reddi	iine to medium sh brown	0.0	
- - - -	С			SAND: Clayey, silty, fine grained, reddis		0.0	
_ _ _ 55	С			GRAVEL: Sandy, silty,	clayey, brown	0.04	
710	С			SAND: Clayey, silty, angular to subangula	medium to coarse, r, poorly sorted	0.06	
- - - /)	С			SAND: Clayey, silty, grained, subangular	0.02		
- - - - -	r;			SAND: Clayey, silty,	brown	0.2	

R	ADIA PORATION	an a		Log of Drilling Operations Born Shed	ng or Well No. 15 et 3 of 3
Grid Coor	Project McClellan AFR IRR Phase II Cell Beginning 8-20-84 and end 8-21-84 of drilling operation Sampling Interval (Estimated) Composite A (ft) Type Drill Rig and Operator Chicago Pneumatic CP2 Log Recorded By W. Boottner NB. Berst				
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
50 - - - - - 35	Ċ			CLAY: Plastic, silty, sandy, fine grained, brown	0.04
- - - - 90	С			CLAY: Plastic, sandy, fine to very fine grained, brown	0.02
- - - - - - 95	C			SAND: Clayey, silty, medium to coarse grained	0.02
- - - - 100	С			CLAY: Silty, sandy, plastic, fine to very fine grained, subangular to subrounded, dark brown	0.01
- - - - 193	С			SAND: Silty, fine to very fine, sub- angular to subrounded, tan	0.06
- - - - :10	C			SILT: Sandy, hard, tan to brown	0.04
— - - - 	(*)			SILT: Sandy, clavey, fine to very tine and medium grained, brown	0.94

SAND: Gravelly, silty, clavey,

fine to medium grained, brown

0.02

RADIAN				Log of Drilling Operations Boring or Well No		
		x		8-21-84	and end of drilling operation	
Grou	nd Level			Type Drill Rig and Opera	ated) Composite (ft) ator <u>Chicago Phe</u> umatic CP2C etther \dags 3. morst	
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks	
120 - - - 123	С			SAND: Micaceous, medium to coarse, Muscovite, Biotite, Hornblende	0.0 Water sample at 120'- pH = 5.5 Temperature = 22°C Conductivity = 230	
	C			CLAY: Silty, sandy, fine to medium grain, dark brown	0.06	
 - 135	С			CLAY: Silty, plastic, scattered grav dark brown	els, 0.0	
- - - 	С			CLAY: Sandy, silty, medium grain, dark brown	0.01	
	С			SAND and GRAVEL: Clayey, medium to coarse	0.0	
151	C			SAND: Clayey, medium to coarse grain plastic clay, dark brown	0.02	
	c			SAND: Clayey, fine to coarse grain, poorly sorted, subangular to subtrounded, clay decreases with depth	0.02	
<u>-</u>	C			SAND: Silty, fine to very fine grai: brown - moist	1, 0.12	

ī

R	ADIA	AN			Boring or Well No. 15 Sheet of of		
Location Grid Cell Coordinates x y				Beginning 8-20-84 8-21-84	and endof drilling operation		
Orou	nd Level	l Elevat	ion: 5	5 ft. MSL (topo). Type Drill Rig and Operator Log Recorded By Poets	<u>Objecto Pre</u> pratic CP 10		
Depth (ft)	fvoe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks		
<u> </u>	ι			SAND: Gravelly, micaceous, medium to coarse grain, red brown - water	0.02 Water sample at 160' pH = 6.2 Temperature = 18°C Conductivity = 215		
				SAND: Gravelly, micaceous, medium to coarse grain, red brown - water	0.02		
· · <u>-</u> 173				SAND: Gravelly, micaceous, medium to coarse grain, red brown	0.02		
• • • •	Ç			SAND: Micaceous, medium to coarse grain, red brown, dark minerals = ~46°	0.03		
- - - - 137	C			SAND: Silty, clayey, micaceous, clay increasing with depth	0.02 -		
- · 190	C			SAND: Silty, clayey, medium to coarse grain, dark minerals = 25%, red brown	0.11		
- - - - 19 +	43			CLAY: Silty, sandy, brown SAND: Micaceous, angular to sub- angular, poorly sorted	3).04 water sample at 200 pi = 5.7 Temperature = 18°C conductivity = 210).04 0.200 42" hole draft times w 32		

Pat Al Depth: 200 Feet

C

43.44.58

Tarks Portland Cemen Type Facility

Boring or Well No. RB-16 Sheet ____ i ___ of _5_ Log of Drilling Operations Project McClellan Phase II Location. 10 August Beginning_ Grid Cell_ 1984 of drilling operation 10 August Coordinates 7800 Sampling Interval (Estimated)_ Type Drill Rig and Operator <u>Dual tabe rotary</u> 52 ft, msl (topo.) .L. Elevation Log Recorded By D. Richmann ID No. of Sample Taken Type of Sample Taken Graphic Log Depth (ft) Lithologic Description Remarks OVM (ppm) TOPSOIL. G SAND; poorly sorted with some fine (),()C gravel; fining downwards to dry yellowbrown silt at approx. 8'. SILT; slightly damp; tan; with occasional ().() lenses of sand and gravel. SAND; fine-grained, coarsening with 0.0depth, some silt; poorly to moderately sorted; dry, tan. 20 SAND: medium-grained: silt in upper 0.0 C approx. 1' of interval; dry; tan. SAND; medium-grained, silty; poorly sorted; dry; tan. SILT; minor silty clay; slightly dame; C, tan.

SAND; and CLAY; interbedded; silty;

moist; brown.

C

oring or Well No. -Sheet _____of_ Log of Drilling Operations Project McClellan Phase II Location_ 10 August Grid Cell_ Beginning_ 1954 of drilling operation Coordinates 6950 Sampling Interval (Estimated)_ Type Drill Rig and Operator <u>Dual tabe retary</u> __ft, msl (topo.) Log Recorded By D. Richmann ID No. of Sample Taken Type of Sample Taken Lithologic Description Remarks OVM (ppm) CLAY; silty, wet in upper approx. I' of С 1).0 interval; damp below; brown. **4**5 (1.1) SILT; some fine sand; slightly damp; С brown. 50 SILT: as above. 0.0 55 SILT; similar to above; some clay, red-0.0 C brown, near base of interval.

SILT; as above.

Output

SILT; as above.

Output

SILT; very fine, color-banded rustbrown to cream; clay, stiff and hard
below approx. 72'.

to rust-brown.

C

SILT; minor hard clavev silt; damp; tan

CLAY; stiff, hard; brown; minor coarse

sandy clay zone approx. 77-78'.

R	ADI/	N		Log of Drilling Operations She	etof
Location				Project <u>McClellan Phase</u> Beginning 10 August 10 August 10 August 10 Sampling Interval (Estimate	$\frac{1984}{684}$ and end of drilling operation and $\frac{5}{6}$ (ft)
· · · · · ·	Elevat	ion 5	2	Type Drill Rig and Operator Type Drill Rig and Operator Log Recorded By <u>P. Bieln</u>	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
50 - - -	С			CLAY; as above; silty to sandy clay zone at base.	∂VM (ppm)).)
0 2 0 2 	C.			CLAY; as above to approx. 80'; then coarse sand zone, brown, damp.	().")
	()			SAND; coarse-grained; poorly sorted; damp; brown.).)
- - - -	Ç	28-15-1		SAND; silty; poorly sorted; wet, tan.	RB-16-1 (100')
	(,			CLAY; silty, hard, slightly damp; brown	(i,)
	r;			SILT; thin gravel zone approx. 107-109', wet but insufficient water to sample.	- - - -
 	41			CLAY; silty, wet; tan.	- - - -
—	Ç	 RB-16-1		SILT; with some class slightly damp; tan.	

R	L.DI	AN		Log of Drilling		ring d eet	or Well No <u>RB-16</u> 4 of 5
Grid		8.7 x y			Project McClellan Phase Beginning 10 August 10 August Sampling Interval (Estimat	ed)_	5(ft)
G.I.	Elevat	ion	52ft	, msl (topo.)	Type Drill Rig and Operato Log Recorded By D.Rich	rDua mann	1 Tube Botary
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description		Remarks
120	C			SILT; as above; zones.	water-bearing in thin		OVM (ppm)
7	C			SILT: as above.			0.0 RB-16-2 (120') = T = 19°C = pH = 5.4 C = 210 minos =
- - - - - -	C			CLAY; silty, pla saturated in thi	astic; verv moist to in zones; tan.		0.0
-					o above with minor ses, silt increasing wit	i in	0.0
- - - -	C				il to above; minor water approx. 140-141.5°.	r	0.0
	C				s above; minor water- approx. 145-147'.		No sample.
	C			SHT; with minor	r sand, Jamp.		
	<i>(</i> .	RB-16-1	3		rined, silty to clayer, cravel; poorly-sorted;		

RADIAN	Log of Drilling Operations	Boring or Well No. $\frac{RF-16}{5}$ Sheet $\frac{5}{5}$ of $\frac{5}{5}$
Location Grid Cell 8, 7 Coordinates x 7800	Beginning	lellan Phase II 10 August 1984 and end August 1984 of drilling operation
y <u>6950</u>	Sampling Inte	erval (Estimated) 5 (ft) and Operator <u>Dual Tube Rotary</u> Bv_D.Biehmann

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160	C			SAND; as above.	OVM (ppm) (),() RB-16-3 (160') T = 18°C pH = 5.6 C = 200 ::mhos
	С			GRAVEL; poorly-sorted with clay matrix; wet; red-brown.	
7 7	С			GRAVEL; similar to above, containing fewer fines with increasing depth.	0.0 Distinctive rounded white clasts in gravel below approx.
	C			GRAVEL; moderately well sorted, few fines; highly productive aquifer.	0.0
195	C			SAND; fine to medium-grained; modera- tely sorted; micaceous; very high water production.	0.0
	C			SAND; as above.	1)
- 20	C.			SAMD; as above.	TD = 200'. Hole grouted with Portland Type I-IT coment. Coment delivered
_	Ι,			MAND; es abore.	through drill stem from bottom of _ hole up to surface

Log of Drilling Operations

Boring	or	Well	No.	_1	. 7		_
Sheet		1		of		5	_

Location			
Grid Cell	_	10, 9	
Coordinates	x	9250	
		8750	

Project McClellan AFB IRP Phase II

Beginning 8-29-84 and end

8-30-84 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Chicago Pneumatic CP2000 Log Recorded By W. Boettner B. Borst

Ground Level Elevation: 55 ft.MSL (topo). Type Drill Rig and Operator Chicago Fneuman Log Recorded By W. Boettner B.

				Log Recorded By <u>W. Boett</u>	ner \B. Herst
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- - - - 5	С			SAND: Clayey, medium to coarse grained, dark red brown	0.01
	С			SAND: Silty, medium to fine grained, brown	0.14
15	C			SAND: Silty, fine to very fine grained, tan	0.12
	С			SAND: Silty, gravelly, fine to very fine grained, tan to brown	0.06
- - - - 25	С			SAND: Clayey, silty, fine to very fine, tan	0.12
— — — —	C			SAND: Silty, clayey, fine to medium grained, reddish brown	0.12
- - - -	C,			SAND: Silty, trace of clay, fine to medium grained, reddish brown	0.14
- - - - -	С			SAND: Clavey, silty, fine to modium grained, reddish brown).08

Boring or Well No. 17 RADIAN Sheet $\frac{2}{}$ of $\frac{5}{}$ Log of Drilling Operations Project McClellan AFB IPP Phase II Location_ 8-29-84 Grid Cell_ Beginning_ and end Coordinates 8-30-84 _of drilling operation Sampling Interval (Estimated) <u>Composite</u> (ft) Type Drill Rig and Operator Chicago Pneumatic CP2: 00 Ground Level Flevation: 55 ft.MSI (topo). Log Recorded By No Boettner ID No_of Sample Taken Graphic Log Lithologic Description Remarks SAND: Clavey, fine to medium grained, 0.1 reddish brown SAND: Clayey, plastic, fine to very 0.2 C fine grained, reddish brown ϵ SAND: Clayev, plastic, fine to very 0.14 fine grained, brown C 0.16 CLAY: Sandy, silty, fine to very fine grained. 0.0 CSILT: Sandy, clayey, light tan SAND: Clayey, silty, very fine grained, 0.0 dark brown CSAND: Clayey, plastic, silty, very 0.1

fine grained, tan to brown

grained, reddish brown

SAND: Clayev, silty, plastic, fine

R	ADIA	- PA		Log of Drilling	Operations	Borir Shee	ng or Well Noof	17
Grid Coor	Cell dinates	х у		ft. MSL (topo).	Project <u>McCle1</u> Beginning Sampling Interv Type Drill Rig a Log Recorded E	8-30-84 ral (Estimated nd Operator)	of drilling of dri	operation (ft) hatic CP2D00
Depth (ft)	Tybe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description		Remari	ks
80 - - - - 85	С			SILT/CLAY: Sandy	, dark brown		0.01	
- - - - 90	С			SAND: Clayey, si tan to brown	ilty, very fin	e grained,	0.02	-
95	C			CLAY: Sandy, si tan to brown	lty, very fine	grained,	0.01 Trace of wonot recove	L
- - - 100	C			CLAY: Sandy, ta	n to brown		0.02	
103	С			CLAY: Silty, sa	ndy		0.00	
- 1:4	C			SAND: Clayey, s fine grained	ilty, fine to	very	0.02	4
-111	C			SAND: Clayey, f	ine grained		0.91	+
1.20	C			SAND: Clayey, p	plastic, brown		0.0	2 B4 165.6

R	ADIA	AN		Log of Drilling	_	ring or Well No. 17 eet of 5
Grid	Cell	×			Project	of drilling operation
Grou	nd Level		ion:	55 ft.MSL (topo).	Sampling Interval (Estimat Type Drill Rig and Operato Log Recorded By No. Boet	r <u>Chicago Pne</u> umatic (P
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
120 - - 125	С			CLAY: Silty, san grained, tan	dy, fine to very fine	0.01
- - :30	С			CLAY: Silty, san very fine grain	0.00	
- - - - - - 35	С			SILT: Sandy, cla grained, brown	yev, fine to very fine	0.01
- - 140	С			SILT: Sandy, cla grained, brown	yey, fine to very fine	0.02
- - - 145 -	С			SILT: Sandy, fin	e to very fine grained	0.02 Water sample at 140'- pH = 6.4 Conductivity = 230 Temperature = 16°C
- - - ! 50	C			CLAY: Sandy, pla brown	stic, silty, dark	0.01
- - - 100	C			CLAY: Sandy, pla brown	stic, silty, dark	0.02
- - - (89)	C			SAND: Clavey, pl very line grain	astic, silty, fine to ed, dark brown	0.12

R	ADIA POHATION	2M	. , -	Log of Drilling	Bor Operations	etof
Grid Coor	Cell dinates	xy	······································	5 ft. MSL (toro).	Sampling Interval (Estimate	and end of drilling operation ed) <u>Commosite 5</u> (ft) Chica to Phermatic CP2000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
160 - - 165	С			CLAY: Plastic,	silty, sandy,brown	0.10
170	С			SAND: Silty, cl	ayey, brown	0.1
175	С			SAND: Silty, cl grained, brown	ayey, fine to very fine	0.2
180	С			SAND: Clayey, s	ilty, micaceous, brown	0.1
135	С			SAND: Silty, m	icaceous, clayey	0.14
190	С			SAND: Silty, m	icaceous, clayey, brown	Water Sample at 190 pH = 6.4 Conductivity = 250
	C			CLAY: Sandy, pl	astic, brown	0.0 -200' 42" hole
	G				Eastic, brown 200 Foot	O-200° 42 hore or sted noise through much tubes w 35 those Continue General Type 1 & 41

Log of Drilling Operations

Boring	or Well	No.	क्ष १३
Sheet	1	of	5

Location			
Grid Cell		10, 9	
Coordinates	×	9650	
	v -	8250	

Project McClellar AFB IPP Phase II 8-30-84 Beginning_ 8-31-84 of drilling operation

Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operator Chicago Pheumatic CP2000 Log Recorded By W. Boettner \[\] \[\] \] \] \[\] \[\] \] \[\] \[\] \[\] \] \[

Ground Level Elevation: 60 ft.MSL (topo).

Depth (ft)	Tvpe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- 0 - 1 - 5	С			SAND: Clayey, silty, medium to coarse grained	ovm(ppm) -
10	С			SAND: Medium to coarse, reddish brown	0.0
-15	С			SAND: Clayey, fine to coarse grained, reddish brown	0.01
20	С			SAND: Clayey, fine to coarse grained, reddish brown	0.0
25	С			SAND: Silty, clayey, fine to coarse grained, reddish brown	0.0
- - - - 30	Ç			SAND: Clayey, fine to medium grained, reddish brown	0.0
	C			SAND: Clavey, plastic, fine to medium grained, reddish brown	0.02
.0	C			SAND: Silty, clayer, fine to medium grained	0.00

Boring or Well No. RB 18 Sheet _ Log of Drilling Operations Project McClellan AFB IMP Phase II Location_ 10, 9 Grid Cell_ Beginning_ 8-30-84 9650 Coordinates 8-31-84 of drilling operation 8250 Sampling Interval (Estimated) <u>Composite</u> Type Drill Rig and Operator Chicago Pneumatic CP2000 Ground Level Elevation: ft.MSL (topo). Log Recorded By W. Boettner Lithologic Description Remarks \mathbb{C} SAND: Silty, clayey, fine to very fine 0.26 grained, reddish brown CSAND: Silty, clayey, fine to very fine 0.18 grained, reddish brown 5:) 0.16 C CLAY: Silty, sandy, fine to very fine brown 0.24 CLAY: Plastic, silty, sandy, fine to very fine grained, brown SAND: Clayey, fine to very fine grained 0.02 brown CSAND: Clayey, plastic, fine to very 0.14 fine grained, reddish brown \mathbf{C} SAND: Clayey, fine to very fine grained, 0.12 brown to tan SILT: Sandy, clavey, very fine to 0.08

medium grained, brown

Boring or Weil No. RB = 18Sheet _____of__ Log of Drilling Operations Project McClellan AFB IMP Phase II Location_ 8-30-84 10. 9 and end Beginning_ Grid Cell_ 8-31-84 9650 Coordinates of drilling operation 8250 Sampling Interval (Estimated) Composite Type Drill Rig and Operator Chicago Pneumatic CP200 Ground Level Elevation: 60 ft.MSL (topo). Log Recorded By W. Boettner ID No. of Sample Taken Lithologic Description Remarks 0.02 С SAND: Clayey, silty (moist) 0.02 CLAY: Silty, sandy, plastic, brown CSAND: Clayey, fine to medium grained, 0.04 brown C SAND: Silty 0.12 100

GRAVEL: Sandy, medium to coarse grained

CLAY: Sandy, plastic

0.02

CLAY: Silty, sandy, dark brown

GRAVELS: Sandy, medium to coarse

 \mathbf{C}

4841835

0.04

Boring or Well No. -Sheet _____ot___ Log of Drilling Operations Project McClellan AFR IPP Phase II Location_ 10, 9 8-30-84 and end Gria Cell Beginning_ 8-31-84 9650 of drilling operation Coordinates Sampling Interval (Estimated) Composite 8250 Type Drill Rig and Operator Chicago Pneumatic CPJ06 Cround Level Elevation: 60 ft.MSL (topo). Log Recorded By W. Boettner ID No. of Sample Taken fyne of Sample Taken Remarks Lithologic Description 0.18 CLAY: Silty, sandy dark brown C 0.10 CLAY: Sandy, silty 80.0 CLAY: Sandy, silty, dark brown C 0.02 Water sample at 140' SILT: Sandy, clayey, dark tan pH = 6.4Conductivity = 240 -Temperature = 20°C 0.01 CLAY: Silty, sandy, dark brown

0.04 CLAY: Plastic, silty, sandy (), ()4CLAY: Plastic, gravelly, sandy, time to coarse grained, dark brown

CLAY: Sandy, zravellz

C

CORPORATION Log of Drilling					Operations	Borir Shee	ng or Well No. <u>18</u> et <u> </u>	
Grid	ation Cell rdinates	x 9	<u>n, 9</u> 1650			8-30-84	Phase II and of drilling opera	
Grou	ind Leve	· 	3250 ion: 60	ft.MSL (topo).	Sampling Interval Type Drill Rig and	(Estimated Operator)	_{n)} Commodite Nicaro Phermatic or ∫0. 5	(ft) (pp_10
Depth (ft)	lype of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description		Remarks	
_ 160 - - - - 163	C			CLAY: Sandy, fin dark brown	e to coarse gra.	ined,	0.2	-
- - - - 170	С			CLAY: Plastic, s	andy, gravelly		0.22	
- - - - 175	С			CLAY: Sandy, mic	aceous, brown		0.18	- - -
- - - ; +()	С			CLAY: Plastic, s brown	andy, micaceous	,	0.14	- - -
- - - - - -	C			SAND: Micaceous,	clayey,brown		0.08	- - -
- - - - ; y()	e;			SAND: Micaceous,	clayey,brown		0.06	- - -
- - : ; ; ;	C)			SAND: Clayev, mi clay with depti	caceous, increas h	l	0.02 0.04 0-200' $\frac{1}{2}$ hole	-
- - - -	C				caceous (moist) 10 Feet		Granted asks thromal times was accessed the many times was accessed to the many the	-

Log of Drilling Operations

Boring	or	Well	No	RB-19
Sheet		1	of	ž

Location 3030 Orange Grove	Project McClellan APB IMP Phase II
Grig Cell 16:09	Beginning 27 August 1984 and end
Coordinates x _ 15,500'	28 August 1984 of drilling operation
y 8.040'	Sampling Interval (Estimated) Composite 5 (ft)
	Type Drill Pig and Operator Prid 1 Tek Dugy S Smit

Ground Level Elevation: apx. 63ft.MSL (topo). Type Drill Rig and Operator<u>Drill Tek D408/S.Smit</u> Log Recorded By R.A. Belan

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
) - - - 5	G			SILT, sand, gravels and clay, brown, unconsolidated, dry.	Drilled by the dual_tube air rotary_method. OVM (ppm) 0.4
10	С		323-23-3	SAND, FN to VF, some coarse sand, tan, unconsolidated, dry.	-
15	С			SILT and SAND, VF, dark tan, unconsolidated, dry.	0.5
20	С			SILT, minor clay, light tan, unconsolidated, dry. Sample difficult to catch.	-
	С			SAND, FN to VF, minor silt, tan, unconsolidated, dry.	0.2
30	(;			SAND, FN to VF, minor silt, tan, unconsolidated, dry.	0.2
- ; .	C			SAMD, FN to VF, minor silt, grayish tan unconsolidated, dry. Trace mica at 33' and turned golden brown.	-
- - - :	()			SILT, unconsolidated, fresh cut looks golden brown, trace mica (cold), drv.	- 0.2 -

R	A	D		A	R	
COD	nne		•	-		

Log of Drilling Operations

Borin : J	्र १५ क्रम	No.	RB-1	9
Sheet			o•	

Location	030 Ora	inge Grove	
Grid Cell_			
Coordinate		15,400'	
		8 0/0	

Project MaChellan AFR IPT Place II

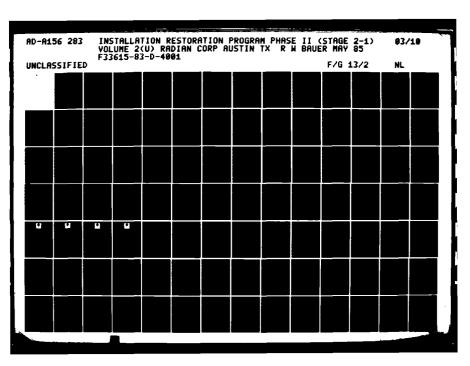
Beginning 27 August 1984 and end
28 August 1984 of drilling operation

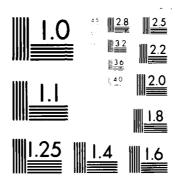
Sampling Interval (Estimated) Sampling Interval (Estimated) Type Drill Rig and Operator Orill Texture States

Ground Level Elevation:apx. 63 (t.MSL (topo). Log Record

Log Recorded By R.A. Gel in

Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
→ V	С			CLAY; semi-plastic, brown.	1)
43	С			SAND and CLAY, brown, slight moisture, sand VF, clay begins at 38 ft.	()
	C			CLAY, minor sand, light brown.	0.5
- - - -	С	RB-19A		CLAY, minor sand, light brown, some moisture.	10
- - - - - -	C			SAND, VF, and silt, unconsolidated, slight moisture.	1.0
	(,			SAND and CLAY; IN to VF, unconsolidated, Tan (sand), brown (clay).	-
-	e ^r			SAND and SILT, FY to VE, tan ind brown, unconsolidated.	:.:
				SHLT, ram, and onsellmated, dry, hard to bet a sample.	. 1





MICROCOPY RESOLUTION TEST CHART

Boring or Well No. RB-19 RADIAN Sheet 3 of Log of Drilling Operations 3030 Orange Grove Location_ Project McClellan AFB IRP Phase II Grid Cell 16:09 27 August 1984 Beginning_ Coordinates 15,400' 28 August 1984 of drilling operation 8.0401 Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operator Drill Tek D40K/S. Smith Ground Level Elevation: apx. 63ft.MSL (topo). Log Recorded By R.A. Belan ID No. of Sample Taken vņe of Sample Taken Graphi Log Lithologic Description Remarks 80 4.0 SAND and SILT, VF, unconsolidated, tan, C slight moisture. -85 SILT, unconsolidated, dry, tan. 0.4 С .90 6.0 SILT and SAND, VF, tan, slight mois-С ture, unconsolidated. .95 Drill pipe got stuck. Water appears to be from SILT, tan, unconsolidated, some about 95-105'. C 21 moisture. 100 С SAND and GRAVEL, Med. to VF, tan (sand) 2.0 dark brown almost black (fine gravels), 105 unconsolidated, dry. С CLAY; brown, slight moisture. 1.2 110

CLAY; brown (sample wet as driller

had to add some water to cut it).

CLAY; same (no sample).

C

C

RB-19-1

115

sample at 120'. W.L.:95' BGL; T:21°C; C: 485; pH: 4.5. (Water may be from

8/28/84-Took water

approx. 105'.)

C

Log of Drilling Operations

Boring	or Well	No. RB-19	
Sheet	4	of5	

Location			
Grid Cell	16	:09	
Coordinates	x	15,400'	
	.,	9 0/01	

Project McClellan AFB IRP Phase II

Beginning 27 August 1984 an

Beginning 27 August 1984 and end 28 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operato Prill Tek D40K/S.Smith

Log Recorded By R.A. Belan

Ground Level Elevation: apx.63 ft.MSL (topo). Log Recorded By R.A. Belan

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
120	С			SAND, FN to VF, unconsolidated, tan and brown, slight moisture (no free water).	0.8
130	С			CLAY, sandy, reddish brown, slight moisture (no free water).	0.6
- 135	С			CLAY and SILT, light brown, unconsoli- dated, silt dry, clay plastic.	1.2
- - - 140	C			CLAY and SILT, light brown, unconsoli- dated clay feels damp. No free water.	3.6 Sieve analysis indicates sands.
-	G	RB-19-	2	GRAVEL (approx. 1'); med-coarse, angular to subangular, unconsolidated, water, mottled brown.	Water came up to 111'. T: 23°C; C: 210; pH: 6.4.
14	5 -			CLAY; brown, moist (no sample).	
150	C 0			CLAY and SAND, clay brown moist w/sand stringers, FN-VF, unconsolidated.	5.0
_ _ _ _ _	C 5			CLAY and SAND, same.	9.5

CLAY, brown, moist.

2 34 165,66

Boring or Well No .. 5 Sheet Log of Drilling Operations Project McClellan AFB IRP Phase II Location_ Beginning 27 August 1984 16:09 Grid Cell_ 28 August 1984 15,400' Coordinates of drilling operation Sampling Interval (Estimated) Composite 5 8.040' Type Drill Rig and Operator Drill Tek D40K/S. Smith Ground Level Elevation: apx. 63 ft. MSL (topo). Log Recorded By R.A. Belan Type of Sample Taken ID No. of Sample Taken Lithologic Description Remarks 160 39.0 water felt CLAY and SILT; brown, moist. C cooler at 160'. Could not get a 165 temperature. SILT and CLAY, minor sand, VF, uncon-18.0 С solidated, brown, some moisture. -170 10.0 SAND and SILT, FH-VF, unconsolidated C (silt white and dry) some clay; gravel @ 173', stringers, water, trace mica 175 (gold). CLAY; brown, stringers (VF), unconsoli-WL: 122' BGL; C T: 27°C; pH: 7.2. dated. 180 RB-19-3 Lots of water, SAND, FN-VF, small gravel, slightly probably from 180golden brown, unconsolidated. 185'. 185 CLAY and SILT @ 187-191', some moisture, 80 С golden brown, unconsolidted (silt). 190 Temperature of run-SAND, Med-FN, mottled brown w/black, C ning water: 27°C. moderate amount of mica (gold flakes) lots of water, unconsolidated. 195 Water from 190-200's Grouted hole throughdual tubes w/38 C SAND, same.

Total Depth: 200

200

RB-19-

Feet

sacks Portland Cement

Type I & II

Log of Drilling Operations

Boring or Well No. RB-20 Sheet 1 of 5

Location_	<u>McClellan</u>	AFB SE Corner	
Grid Cell	16:10		
Coordinate	es x	15,740'	
	у	9,710'	_

Project McClellan AFB IRP Phase II

Beginning 29 August 1984 and end

29 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Drill Tek D40K/S. Smith

Ground Level Elevation: apx.68 ft.MSL (topo).

Log Recorded By R.A. Belan

				Log Recorded By R.A. Bell	<u>an</u>
Depth (ft)	Tvņe of Sample Taken	ID No, of Sample Taken	Graphic Log	Lithologic Description	Remarks
0	G			SILT and CLAY, tan.	Drilled by the dual_tube air rotary method. OVM (ppm) 0.1 (background)
- - - - 10	С			SAND and CLAY, VF, tan, unconsolidated.	1.0
- - - - 15	С			SILT, tan, unconsolidated, dry.	2.5
- - - - 20	С			CLAY and SILT, tan, unconsolidated.	3.0 (sample is wet will drill water)
- - - 25	С			SAND, FN-VF, tan, unconsolidated, dry.	1.8
- - - - 30	С			SILT and SAND, VF, light brown, uncon- solidat d, some moisture.	1.5 0.5 (background)
- - - 35	С			CLAY, light brown, damp.	Driller cut w/water- 15.0
- - - - 4)	С			CLAY, light brown.	-

R	A	6	A	R	I

Log of Drilling Operations

Boring or Well No. RB-20 Sheet 2 of 5

Location_1	McClella	n AFB	SE (Corner	
Grid Cell_					
Coordinate		15,740)*		
		9,710)*		

Project McClellan AFB IRP Phase II

Beginning 29 August 1984 and end 29 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Ground Level Elevation: apx.68 ft.MSL (topo).

Type Drill Rig and Operator <u>Drill Tek D40K/S.Smith</u> Log Recorded By R.A. Belan

						=
	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Descr tion	Remarks	
40 - - - - 45	С			SAND and SILT, VF-FN, reddish brown, unconsolidated, some moisture.	3.0	1-1-1-1
- - - - 50	С			SAND and SILT, VF, reddish brown and tan, unconsolidated, some moisture.	3.8	
- - - - 55	С			SAND and SILT, FN-VF, tan, unconsoli- dated, dry.	3.8	
60	С			SAND and SILT, FN-VF, tan, unconsoli- dated.	3.8 0.7 (background)	
65	С			CLAY and SAND, VF, tan, unconsolidated, dry.	2.9	
70	С			CLAY and SAND, VF, brown, unconsolidated dry.	-	
73	С			CLAY and SAND, VF, brown, unconsolidated dry.	-	
_ _ _ _ _ _ _ _ 80	C			CLAY and GRAVEL, FN-Med, unconsolidated, dark brown (almost black), dry.	3.2	<u> </u>

Log of Drilling Operations

Boring or Well No. RB-20 Sheet ___3_

Location McClellan AFB SE Corner	Project McClellan AFB IRP Phase II
Grid Cell 16:10	Beginning 29 August 1984 and end
Coordinates x 15,740' v 9,710'	29 August 1984 of drilling operation
	Sampling Interval (Estimated) Composite 5 (ft)

Ground Level Elevation apx. 68 ft. MSL (topo). Type Drill Rig and Operator Drill Tek D40K/S. Smith

<u> </u>				Log Recorded By R.A. Be	lan
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- 80 - - - - 35	С			SAND and SILT, VF, unconsolidated, dry, tan.	0.8
90	С			CLAY and SAND, VF, unconsolidated, light brown.	Driller cut/water.
95	С			CLAY and SAND, VF, unconsolidated, light brown.	Driller cut w/water_
- - - 100	С			CLAY and SAND, VF, unconsolidated, clay is hard, light brown.	Drilling slow due to hard clay, cut w/water. 0.2 (background)
- - - 105	С			CLAY, hard, brown.	9.0
_ _ 110	С			SAND and CLAY, VF, unconsolidated, brown	. Driller cut w/ water.
- - - 115	С			CLAY; brown, some sand, unconsolidated.	1111
_ _ _ 	С			SAND, Med-FN, unconsolidated, light brown.	Driller cut w/water

Log of Drilling Operations

Boring or Well No. RB-20 Sheet ___4

Location McClellan AFB SE Corner Grid Cell_ 16:10 Coordinates 15,740' 9,710

Project McClellan AFB IRP Phase II

Beginning 29 August 1984 29 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operato Prill Tek D40K/S. Smith

Ground Level Elevation: apx.68 ft.MSL (topo).

	-			Log Recorded By R.A. Be	elan
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
120	С			CLAY, SAND, GRAVEL; light brown.	
130	С			CLAY, SAND, and GRAVEL; brown, uncon- solidated.	Trace water @130'.
135	С			CLAY, SAND, GRAVEL; brown, unconsoli- dated.	Water
- - - 140	С	RB-20-1		Same	Obvious water from about 30-140'. Fluid level: 103' BGL; T: 23°C; C: 185; pH: 7.4.
- - 145	С			SILT and CLAY, unconsolidated, tan to brown, silt, dry, clay slight moisture.	1.5
150	С			Same, no sample.	
- - - 155	C			SAND, Med., mottled brown, unconsolidated.	No free water.
160	C	RB-20-2		CLAY and SAND, VF, brown, plastic.	Fluid level: 103'; T: 23°C; C: 320; pH: 7.4.

RADIAN Boring or Well No. RB-20 Log of Drilling Operations Sheet ___5 ___ of __5 Location McClellan AFB SE Corner Project McClellan AFB IRP Phase II Grid Cell_ 16:10 Beginning 29 August 1984 and end 15,740' Coordinates 29 August 1984 of drilling operation 9,710 Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operator Drill Tek D40K/S. Smith Ground Level Elevation: apx.68 ft.MSL (topo). Log Recorded By R.A. Belan

				Log Recorded By K.A. Be	lall
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160	С			CLAY; hard, brown.	Driller cut w/water.
170	С			CLAY and SAND, brown, hard.	Driller cut w/water_
175	С			CLAY and SAND; brown, hard, water, some gravel.	
180	С	RB-20-3		CLAY and SAND, brown, FN-VF, uncon-solidated.	Fluid level: 106' BGL; T: 23°C; C: 300; pH: 7.6.
_ _ _ 185	С			CLAY and SAND, brown FN-VF, unconsolidated, turned golden @ approx. 83'.	
190	С			Same.	Water feels colder when small water zones encountered.
_ _ _ 195	С	RB-20-4		Same.	Fluid level: 136' BGL. T: 25°C; C:
200	С	RB-20-5		SAND, Med-FN, angular to sub-angular. mica (gold), unconsolidated. Total Depth: 200 Feet	190; pH: 7.4. Grouted hole through— dual tubes w/ 39 sacks Portland Cement Type I & II

84 10500

R	ADIA	3N		Log	of Drilling	Operations	Borir Shee	ng or Well No. $\frac{21}{}$ of $\frac{1}{}$	5
Grid Coor	dinates	x10 y21	. 22 .250 .650			Sampling Inte	8-17-84 rval (Estimated	of drilling ope Composite 5 Chicago Pneumat	(ft)
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log		Litholog	gic Description		Remarks	
- - - - -	С			SAND:	Silty, fir	ne to very f	ine, brown	ovm(ppm)	
- - - - - -	С			SAND:	Silty, fir	ne to very f	ine, brown	0.1	
_ _ _ 15	С		F2-5-2-2-	SAND:	Silty, fi	ne to very f	ine, brown	0.1	
20	С			SILT: plas		andy, clay s	omewhat	0.05	1 1 1
25	С			SILT:	Clayey, s	ilt, brown		0.05	7 7 7 7
30	С			CLAY:	Silty, br	·own		0.05	
35	С			SILT:	Sandy, cl	ayey, tan		0.04	4111
- - - 40	С			SILT:	Sandy, cl	layey, tan		0.05	

R	ADIA	3N		Log of Drilling		ng or Well No. $\frac{21}{}$ et $\frac{2}{}$ of $\frac{5}{}$
Grid Coor	Cell dinates	х у		66 ft.MSL (topo).	Sampling Interval (Estimate	and end of drilling operation d) Composite 5 (ft) Chicago Pneumatic CP2000
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	• Litholog	gic Description	Remarks
40	С			SAND: Clayey, me FeO _x staining,	edium to coarse grain, red brown	0.04
- - - - 50	С			SILT: Clayey, sa grain, brown	andy, fine to very fine	0.02
- - -	С			CLAY: Sandy, si!	lty, brown	0.05
- 55 60	С			SILT: Sandy, cla	ayey, reddish brown	0.1
- - - 65	С			SILT: Clayey, p	lastic, dark brown	0.02
70	С			SILT: Clayey, b	rown	0.03
- - - - - 75	С			CLAY: Silty, sa grain, brown	ndy, medium to coarse	0.1
_ _ _ _ _ 30	С			CLAY: Silty, br	nwn	0.1

R	ADI	AN		Log of Drilling	Operations Bor She	ing or Well No et3ot5
Grid Coor	tion Cell dinates	Project McClellan AFB I Beginning 8-17-84 8-17-84 Sampling Interval (Estimate Type Drill Rig and Operator Log Recorded By W. Boets	and end of drilling operation ed) Commosite 5 (ft) Chicago Pneumatic CP2			
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
80 - - - - 85	С			CLAY: Silty, har	rd, brown	0.05
- 90	С			SILT: Clayey, b	cown	0.12
- 95	C			SAND: Clayey, s grain, brown	ilty, fine to very fine	0.02
_100	С			SAND: Clayey, s grain, brown	ilty, fine to very fine	0.1
_105	С			CLAY: Silty, sa	ndy, moist	0.4
 110	C			SILT: Sandy, fi brown	ne to very fine grain,	0.1
→115	C			CLAY: Silty, sa	ndy, brown	0.05
•	С			SAND: Silty, cl grain, brown	ayey, fine to medium	0.02

3

Log of Drilling Operations Boring or Well No. 21 Sheet 1 of 5							
Location Grid Cell Coordinates x y			Beginning 8- 8- Sampling Interval (Es	17-84 17-84 stimate	and er of drilling operation a) Composite 5	on ft)	
Obepth (ft) Sample of Sample Taken Do No. of Sample Taken Craphic Graphic Graphic Log		Graphic or Log	Lithologic Description	Boett	Chicago Phenmatic Coner NB. Hors Remarks	1100	
120	C	OI L	9	SAND: Silty, fine to very fine gra brown	in,	0.02	
- - - - 130	С			SAND: Silty, clayey, fine to very grain, brown	fine	0.01	
_ _ _ 135	С			SAND: Silty, clayey, fine to medium grain, brown	m	0.01	1 1 1
- - - 140	С			SAND: Silty, medium to coarse grain abundant water (~250 GPM)	n,	0.01 Water sample at 14(pH = 4.5 Temperature = 21°C Conductivity = 200	7
_ _ 145	С			SAND: Clayey, fine to medium grain, brown	•	0.01	1
- - - 150	C			SAND: Gravelly, coarse to very coar clean quartz sand	rse	0.02	
_ _ _ ;55	С			SAND: Silty, clayey, medium to coar grain, clay increases with depth	rse	0.01	1
_ _ 	C			SAND: Micaceous, medium to fine grabrown, small amount of water	ain,	0.02	6 84 16506

R	ADIA	AN			ring or Well No. 21 eet 5 of 5
Grid	Cell	x		Project McClellan AFB I Beginning 8-17-84 8-17-84 Sampling Interval (Estimate	and endof drilling operation
Grou	ind Level	l Elevat	ion: 6		Chicago Pheumatic CP2000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160 - - - 165	С			SAND: Silty, fine to very fine grain, brown	0.02 Water sample at 160'_pH = 4.5 Temperature = 22°C Conductivity = 200
170	С			SAND: Silty, coarse, trace amount of clay	0.01
175	C			SAND: Silty, medium to coarse, brown	0.02
180	С			SAND: Silty, medium to coarse, clay <10%	0.01
_ _ _ 	С			SAND: Clayey, medium to coarse grain, brown	0.01
- - - - - 190	С			CLAY: Sandy, fine to medium grain, clay, plastic, tan Total Depth: 190 feet	0.02
- - - - 195	С				0.02
- -	С				0.02 0-190' 42" hole Grouted note through dual tubes w 31 = 5 sacks Portland Cement

Boring or Well No. -Sheet 1 of Log of Drilling Operations Project McClellan AFB IRP Phase II Location_ 8-22-84 3,17 and end Grid Cell Beginning_ 8-22-84 2950 Coordinates of drilling operation Sampling Interval (Estimated) Composite 5 16950 Type Drill Rig and Operator Chicago Pneumatic CP2000 Ground Level Elevation: 45 ft.MSL (topo). Log Recorded By W. Boettner ID No. of Sample Taken Lithologic Description Remarks ovm(ppm) 0.0 С SAND: Silty, fine to medium, tan to brown 0.04 С SAND: Medium to coarse, brown 10 0.2 SAND: Silty, clayey, poorly sorted, С subangular to subrounded -15 0.3SAND: Silty, clayey, fine to medium С grained, increasing clay content, tan 20 0.1 SAND: Clayey, subangular to subrounded C grains, Biotite, Hornblende SILTY SAND: Clayey, fine to very fine 0.12 grain, light tan 0.05 SAND: Silty, clayey, fine to medium grain, angular to subangular, micaceous (Muscovite), red brown

SAND: Trace of silt and clay, medium to coarse grained, poorly sorted,

С

R	ADIA	AN		Log of Drilling Operations Boring or Well No. 22 Sheet 2 of 5			
Grid Coor	Cell dinates	х у			Project McClellan AFB IS Beginning 8-22-84 8-22-84 Sampling Interval (Estimate Type Drill Rig and Operator	of drilling op d) Comnosite 3	ceration (ft)
Cfp (ff)	vive of Sample Taken	Sample Taken	Graphic Log	ft.MSL (topo).	Log Recorded By W. Boettner \\S. ogic Description Remarks		<u>Horst</u>
40 - - - - - - 45	c c	0.0	9	SAND: Clayey, si grained, tan to	lty, fine to very fine grayish	0.01	
- - - _ 50	С			SAND: Silty, fin	0.02		
— — — — — 55	С			SAND: Clayey, pl grained, brown	astic, fine to medium	0.02	1
- - - - - 60	С				lty, fine to very fine gular to subrounded,	0.08	
- - - 65	С			SAND: Clayey, si gravels, fine g with depth	lty, siltstone, grained, increasing clay	0.06	
- - - - 70	С			CLAY: Sandy, fin	ne to very fine grained,	0.1	
	С				ne to medium grained, subrounded, poorly ous (Muscovite)	0.04	
- - -	С			SAND: Clayey, si plasticity, dar	ilty, increasing clav k brown	0.04	1 1 1 1 (84 1650)

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R	ADI	AN		Log of Drilling Operations		ing or Well Noeet3of	
Grid Coo	Cellrdinates	х у		Project McCleltan Beginning 8-22 8-22 Sampling Interval (Est Type Drill Rig and Or Log Recorded By W.	-84 -84 stimate perator	of Crilling o ed) Composite 5 rChicago Pneum	peration (ft) atic CP2000
Depth (tt) Trype of Sample Taken ID No. of Sample Taken Craphic Log			Graphic Log	Lithologic Description		Remark	ıs
80	С			SAND: Clayey, fine to medium grain subangular to subrounded	ned,	0.01	
- - - 90	С			CLAY: Silty, sandy, fine to medium grained, high plasticity, dark b		0.1	-
_ _ _ _ _ 95	С			SAND: Clayey, silty, fine to very grained, subangular quartz, brown		0.08	
	С			SAND: Silty, clayey, gravelly, fin medium grained		0.08 Water sample pH = 5.4 Conductivity = Temperature =	= 260 22°C
- - - - - - 105	С			CLAY: Sandy, plasticity high, brow	wn	0.06	1
- - - - -	С			SAND: Clayey, fine grained, plast	ic	0.08	
- - - - - 115	С			SAND and GRAVEL: Clayey, fine to medium grained, brown		0.02	
- - - 120	С			SAND: Silty, clayey, fine to very fine grained, subangular to subre		0.14	1 1 1 1 84 16566

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R	ADI	AN		Log of Drilling			
Grid CellCoordinates		х у		ft.MSL (topo).	Sampling Interval (Estimaty) Type Drill Rig and Operat	IRP Phase II 34 and end 34 of drilling operation ated) Composite 5 (ft) tor Chicago Pneumatic CP200 ettner B. Horst	
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks	
120 ₁	С			CLAY: Plastic ch sand	0.06		
- - - - 130.	С			GRAVEL: Clayey,	sandy, brown	0.02	
_ _ 135	С			CLAY: Gravelly,	brown	0.02	
- - - - 140	С				and, fine to medium me small gravels	0.08	
- - - - -145	С			SAND: Coarse sand	d and gravel, water	0.02 Water sample pH = 5.4 Conductivity = 240	
 - - - 150	С			SAND: Coarse sand brown, water	d and gravel, silty,	Temperature = 22°C 0.02	
155	С			SAND: Coarse sand	d and gravel, water	0.01	
_ _ _ _ 160	С			SAND: Silty, clay	vey, fine to coarse me gravels	10.00	

COR	ADIA	2N		Log of Drilling	O	ng or Well No. <u>22</u> et <u>5</u> of <u>5</u>
Grid		x			Project McClellan AFB III Beginning 8-22-84 8-22-84 Sampling Interval (Estimated	and end
Grou	nd Level	Elevat	ion: 45	ft.MSL (topo).	Type Drill Big and Operator	hicago Prejmatic CP3000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
160 - - - - 165	С				arse grained, dark e, Hornblende) about 15%	0.0
	С			SAND: Silty, med sorted, brown	dium to coarse, poorly	0.0
 175	С			SAND: Silty, cla	ayey, medium grained,	0.06
- - - - - 180	С				Silty, clayey, medium and, brown to tan,	0.04 Water sample pH = 6.2 Conductivity = 200 Temperature = 18°C
_ _ _ _ 	С			SAND: Clayey, s to coarse grain	ilty, gravelly, medium ned	0.02
190	С			SAND: Clayey, g coarse grained	ravelly, medíum to	0.1
195	С			CLAY: Sandy, gr with depth, br	avelly, clay increasing own	0.2 0.1 0-200' 42" hole
200	C			CLAY: Sandy, gr Total Depth: 2	avelly 00 Feet	Grouted hole through dual tubes w/39 sacks Portland Cement Type I & II

R	ADI	AN		Log of Drilling Operations Bort	ng or Well No. <u>23</u> et <u>1</u> of <u>5</u>			
Grid Cooi	Cell dinates	7 x 640 y 1195	00 50	Beginning 8-24-84 8-24-84 Sampling Interval (Estimate Type Drill Rig and Operator	- Sampling Interval (Estimated) Composite 5 (ft) Type Prill Ric and Operator Chicago, Progratic CP20(
Depth (ft)	Log Recorded By W. Boett				Remarks			
- - - - - 5	С			SAND: Silty, fine to very fine, tan to brown	ovm(ppm) -			
- - - - - 10	С			SAND: Clayey, silty, fine to very fine grain, increasing clay with depth, light brown	0.02			
- - - 15	С			SAND: Clayey, gravelly, fine to medium grain, clay highly plastic	0.01			
20	С			SAND: Silty, clayey, fine to medium grain, subangular to subrounded, brown	0.01			
- - - 25	С			SAND: Silty, fine to coarse grain, subangular to subrounded, brown	0.01			
- - - -30	С			SAND: Clayey, silty, fine to medium grain, subangular to subrounded, tan	0.01			
35	С			SAND: Clayey, fine to medium grain, plastic, tan to brown	0.01			

CLAY: Sandy, silty, fine to very fine grain, plastic, brown

0.01

С

R	ADIA	AN		Log of Drilling Operat	ions St	oring or Well No neet2	of $\frac{23}{5}$			
Grid	ation Cell rdinates			Beginni	McClellan AFB ng 8-24-8 8-24-8	34 84 of drilling	and end			
Grou	Ground Level Elevation: 50 ft.MSL (topo). Type Drill Rig and Operator Chicago Pneumatic CP2000 Log Recorded By W. Boettner B. Berst									
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Descr	iption	Rema	rks			
- 40 - - - - 45	С			SAND: Silty, fine to ve Quartz, Biotite, Horne	ry fine grain, blende, brown	0.01				
- - - 50	С			SAND: Fine to very fine subangular, poorly sor		0.01				
· · · - 55	С			SAND: Silty, clayey, fir angular to subangular,		0.01	1			
- 60	С			SAND: Silty, clayey, firgrain, brown, clay inc depth.		0.01				
– 65	C .			SAND: Clayey, trace of every fine grain, poorly	silt, medium to sorted, brown	0.01	1			
_70	С			SAND: Clayey, silty, fir grain, subangular to re sorted, dark brown		0.01	1111			
. 75	С			SAND: Silty, clavey, fir fine, poorly sorted, by		0.01	7777			
20	С			SAND: Silty, fine to ver angular to subrounded,		0.02				

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R	ADIA	3N	· · · · · · · · ·	Log of Drilling	Operations	~	ng or Well No et3of _	5
Grid Coor	Celldinates	x yel Elevation: 50 ft.NSL (topo).			Sampling Int Type Drill Rig	erval (Estimate	of drilling op d) Composite 5 Chicago Pneuma	(ft)
Depth (ft)	lvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	1	Remarks	•
- 80 - - - - 85	С			SAND: Silty fine red brown	to very fi	ne, clayey,	0.01	
- - - 90	С			CLAY: Fine to ve	ry fine sand	dy, moist	0.0	
	С			CLAY: Fine to me brown	dium sandy,	plastic,	0.02	1
100	С			CLAY: Sandy, fin	e to very f	ine, brown	0.01 Water sample a pH = 5.8 Conductivity = Temperature =	: 260
105	С			CLAY: Sandy, pla	stic, brown		0.02	
- 110	C			SILTY CLAY: Sand gravelly	ly, fine to	medium,	0.01	
	C			SILTY CLAY: Sand brown	ly, gravels	up to 2 mm,	0.0	1
- - -	c			SILTY CLAY: Sand	ly, fine to	medium,	0.01	

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R	ADIA	ME		Log of Drilling	g Operations		ng or Well No. <u>2</u> et <u>4</u> of _		
Grid		×				0-24-84	of drilling ope	eration	
Grou	Sampling Interval (Estimated) Composite 5 (ft) Ground Level Elevation: 50 ft.MSL (topo). Type Drill Rig and Operator Chicago Pneumatic CP20 Log Recorded By W. Boettner \B. Horst								
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithold	ogic Description		Remarks		
120	С			SAND: Clayey, si subrounded, poo		to	0.0		
- - - 130	С		252255	SAND and GRAVEL: tan to brown	Silty, plastic	c, clayey:	0.01	1	
135	С			SANDY SILT: Fine hard, dark brow		very	0.0	-1-1-1-1	
140	С			SAND: Fine to ve small amount of		tan,	0.0		
145	С			CLAY: Sandy, gra brown	avelly, plastic,	, dark	0.02		
	C			CLAY: Silty, bro	own, hard		0.01		
:) 5	(`			CLAY: Silty, sar	ndy, brown		0.0		
150	('			SILT: Gravelly,	water		0.0 Water sample at pH = 5.2 Temperature = Conductivity =	19°6	

R	ADI	AM		Log of Drilling		Boring or Well No. 23 Sheetof5	
Grid	tion Cell dinates	x			Project	3 In Marke II 34 and e 34 of drilling operationated) 1 commo sitte is	end ion
Crou	nd Level			50 ft.MSL (topo).	Type Drill Rig and Opera	ated) <u> </u>	JP 2000
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks	
160	С			CLAY: Silty, sa	ndy, hard, brown	0.01	
- 165 170	С			SAND: Medium to	coarse, clean, brown	0.02	1-1-1-1
175	C			GRAVEL: Sandy		0.02	
130	С			SAND: Gravelly, sandy	medium to coarse,	0.01 Water sample at 18 pH = 6.0 Temperature = 16°C Conductivity = 220	
_ _ _ 	С			SAND and GRAVEL: water	Medium to coarse,	0.01	
_ _ 190	С			SAND: Clayey, f	ine to very fine, tan	0.02	
- - - - - -	С			SAND: Clayey, f	ine to very fine	0.04	
- - - - 200	C			micacoous	clayey, very fine, O Feet	0-200' 42" hole drive incle through the Sacks Pirtling Company 0.02	£

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					RB-24			
R	ADIA	N E		Log of Drilling Operations Shee	ng or Well No. RB-24 et 1 of 5			
				Log of Drilling Operations				
Grid	tion Cell	8, 14		Project McClellan AFB II Beginning 2 August 198 2 August 1984	RP Phase II and end			
Coor	dinates	x 7425 y 13,5						
		y		Tune Brill Big and Operated	d) Composite > (ft)			
Grou	nd Level			1 ft.MSL (topo). Log Recorded By T. Walte	_ \			
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
J					Drilled by the dual			
_	<u> </u>	ļ			tube air rotary			
_	С			TOPSOIL; unconsolidated silt, sand and	0.0			
- 5		\ 		gravel.				
	ļ	l			-			
-				SILT; unconsolidated, sandy from 8-10'.	-			
-	C				0.0			
10								
<u> </u>		ļ			-			
-	С			CLAY; silty, good plasticity, red, slightly moist.				
					0.0			
15								
-	1	Į						
	С			SILT; well sorted, brown.	0.0			
-				ordin, well server, case.	-			
- 20								
L	}							
L	c			SILT; fine, yellow, becoming coarser	0.0			
H				with depth.				
25					_			
<u> </u>								
-	C			SILT; sandy, fine-med. grained, yellow- brown, micaceous, black l'thick frag.	0.0			
- , o				10%.				
30				-	-			
-				drym. Gian amained well corted red	0.0			
L	C			SILT; fine-grained, well sorted, red, slightly damp.	-			
<u></u>								
-	1				-			
	С			SILT; well sorted, red-brown, slightly	0.0			
				damp.	_			

cos	ADI	AN		Log of Drilling		eet 2 of 5
Grid Coo	ation Cell rdinates	8. 74 y 11	2 August 198 Sampling Interval (Estimat	1984 and end 4 of drilling operation (ft) Drillsystem 1000 CSR/		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
40 - - - - 45	С			SAND; silty, fine rounded, light br	e-medium grained, well own.	0.0
- - - - 50	С				nterbedded, clay, red silt, fine-grained,	0.0
- - - - 55	С			SILT; clayey, dar plasticity, tan-g	k brown, clay, good gray.	0.0
- - - 50	С			SAND; silty, fine silt, interbedded	e-grained, w/yellow	0.0
-	Ü			SILT; well sorted coarsening downwa		0.0
-	ij			SAND; silty, fine sorted, subrounde	e-medium-grained, mod.	0.0
0 - - - 7:	1.				plasticity, moist, own, increase in clay	0.0
- - - - -	i)			SILT; clayev, tan,	slightly moist.	Dropped probe; no water in borehole.

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R	Log of Drilling Operations Boring or Well NoRB-24 Sheet 3 of 5						
Grid Coor	tion Cell dinates	8. 14 x 74 y 13	25 .550	Project McClellan AFB IT Beginning 2 August 1984 2 August 1984 Sampling Interval (Estimate Type Drill Rig and Operator	of drilling operation Composite 5 (ft) Drillsystem 1000 CSR/		
Grou	nd Level			Log Recorded By T. Walt	ers \L. Holtort		
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks		
80 - -	С			SAND; fine-grained, well sorted, quartz subangular.	0.0		
- 85 - - - - 90	С			SAND; coarse-grained, micaceous, water- bearing.	0.0 Water sample Water 87' pH 6.5 Temp. 23°C Cond. 210		
- - - - -95	С			SAND and CLAY; interbedded, increasing in clay brown, confining.	0.0		
- - - - 100	С			CLAY; gray, good plasticity, sand; fine- coarse poorly sorted, oxidized.	_		
- - - - - - 105	С			CLAY; silty tan brown, fair plasticity.	0.0		
- - - - 1:0	C			SAND and CLAY; hard, cemented, "pop-corn" waterbearing.	Water sample 0.0 - PH 7.1 - Temp. 18°C - Cond. 210		
- - - 115	С			CLAY; very good plasticity, gray.	0.0		
120	C			SAND; hard, cemented, dark brown, pop- corn texture, possible reggolith.	0.0		

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R	ADIA	1 N		Log of Drilling Operations	Boring or Well No. RB-24 Sheet of 5			
Grid Coor	tion Cell dinates nd Level	8, 14 x 742 y 13.	550	Beginning 2 August 2 August Sampling Interval (Es Type Drill Rig and Op	Project McClellan AFB IRP Phase II Beginning 2 August 1984 and end 2 August 1984 of drilling operation Sampling Interval (Estimated) Composite 5 (ft) Type Drill Rig and Operator Drillsystem 1000 CSR Log Recorded By T. Walters L. Holtort			
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
120 - - - 125	C			SAND; fine-grained, with clay matri water-bearing, brown.	0.0	1		
- - - 130	С			Same as above.	0.0 Water sample pH 7.5 Temp. 19°C Cond. 250			
_ _ 135	С			CLAY; good plasticity, yellow-gray, confining.	, 0.0	1-1-1-1		
- - - 140	С			Same as above.	0.0	1 1 1		
145	С			SAND; clayey, interbedded, yellow-g beds l'thick.	gray, 0.0			
130	C			CLAY; gray, extremely plastic.	0.0	-		
_ _ 155	C			SAND and GRAVEL; fine-coarse, poorsorted, high energy, sharp contact above unit.	with	-		
F				GRAVEL; sandy, channel-high energy	0.0 Rig shimmy 157-160	. –		

poorly sorted, quartz angular, clearyellow.

greatest amount of gravel in borehole.

R	ADIA	AN			ing c. Well No. RB-24 et5 of5
Grid	ition Cell dinates		25 • 550	Project McClellan AFB I Beginning 2 August 19 2 August 1984 Sampling Interval (Estimate	84 and end of drilling operation
Grou	nd Level	l Elevat	ion:	51 ft.MSL (topo). Type Drill Rig and Operator Log Recorded By T. Walt	Drillsystem 1000 CSR/
Depth (ft)	Tvoe of Sample Taken	ID No. of Sample Taken	Graphic	Lithologic Description	Remarks
160 - - - - 165	С			SAND; hard, cemented, oxidized, w/gypsum 20% popcorn texture.	0.0
- - - - - 170	l .			SAND; hard, cemented with clay, red. Increase in gypsum, 30%.	0.0
- - - - -175	С			SAND; coarse, poorly sorted, clay clasts 15%, black lithoc frag. 10%.	0.0
- - -	С			SAND, fine-med. grained, mica cears, v.	0.0
180 	С			well sorted, well rounded, water red, oxidized, black lithic frag. 10%.	+ 100 gpm.
135 _ _ _ _	С			SAND and GRAVEL; same as above, coarsen- ing downward.	0.0
	C			SAND and GRAVEL; high energy, poorly sorted, lithic 20%, quarts is subangular, clear-yellow, oxidized. CLAY; gray, fair plasticity, semiconfining.	0.0
195 200	Ċ			Total Depth: 195 Feet	Grout noise through dual tubes w/Ready Six Portland Cement Type I & II.

Log of Drilling Operations

Boring or Well No. $\frac{RB-25}{\text{of } 5}$

Location	Far Nort	heast Corner	of Flightline	Project McClellan AFB IRP Phase II					
	15:25			Beginning_	31 August	1984	·		d end
Coordinate	s x	14,050'			eptember 198		of drilli	ing oper	ration
	у	24,160'		Sampling Ir	nterval (Estim	ated).			
Ground Le	vel Fleva	tion:anx.72	fr.MSL (ropo).		Rig and Opera				

Ground Level Elevation:apx.72 ft.MSL (topo). Log Recorded By R.A. Belan

Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
0 - - - - 5	G			SAND and CLAY; hard, dry, Md-FN, brown to reddish brown.	Drilled by the dual_tube air rotary method. OVM (ppm)
10	С			SILT and CLAY, minor sand, brown, dry, unconsolidated.	35.0
- - - -	С			CLAY; brown, unconsolidated, dry.	Driller cut w/water.
15	С			SAND; FN-VF, tan, unconsolidated.	52.0
_ _ _ _ _ 25	С			SAND and SILT; FN-VF, tan, unconsoli-dated, dry.	18.5
- 30	С			SILT; tan, unconsolidated, dry.	49.0
- 35	C			CLAY, brown, unconsolidated, drv.	6.0
40	С			CLAY, brown, unconsolidated, dry.	Driller out w/water.

Log of Drilling Operations

Boring or Well No. RB-25 Sheet _

Location Far	<u>Northeast</u>	Corner	of_	<u>Flightline</u>
Grid Cell	15:25			
Coordinates	x	14,050'		
	у	24,160		

Project McClellan AFB IRP Phase II 31 August 1984 Beginning 31 August 198 1 September 1984 of drilling operation Sampling Interval (Estimated). Composite 5

Ground Level Elevation: apx.72 ft.MSL (topo). Type Drill Rig and Operator Drill Tek D40K/S.Smith Log Recorded By R.A. Belan

				Log Recorded By R.A. Bel	lan
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- - - - - - 45	С			SILT, yellowish, brown, unconsolidated, dry.	9.6
_ _ _ _ 50	С			SILT and CLAY, brown, unconsolidated, slight moisture.	22.5
_ _ _ 55	С			SILT and CLAY; same.	-
60	С			CLAY, brown, dry, unconsolidated.	Driller cut w/water
- - - 65	С			SAND and CLAY, FN-VF, tan, unconsoli- dated, dry.	4.0
70	С			CLAY, light tan, unconsolidated, slight moisture.	1.5
_ _ _ _ 75	С			SAND and SILT, minor clav, FN-VF, tan, unconsolidate.	0.2
30	С			CLAY, brown, unconsolidated.	Driller cut w/water. 43.0

Boring or Well No. RB-25 RADIAN Sheet __3 of Log of Drilling Operations Project McClellan AFR INP Phase II Location Far Northeast Corner of Flightline 15:25 Grid Cell_ Beginning 31 August 1984 Coordinates 14,050' 1 September 1984 of drilling operation 24,160' Sampling Interval (Estimated) Composite Type Drill Rig and Operator Drill Tek D4CK S. Smit Ground Level Elevation: apx.72 ft.MSL (topo). Log Recorded By R.A. Belan ID No. of Sample Taken Sample Lithologic Description Remarks 80 SILT and CLAY; unconsolidated, brown 19.3 C(clav), off-white (silt), dry to slight moisture. -85 CLAY; minor silt, brown, unconsolidated, Driller cut w/water. C 38.9 dry. .90 3.5 CLAY; brown, unconsolidated, dry. C 95 CLAY; brown, minor silt, unconsolidated, 1.2 C dry. 100 CLAY, SILT and SAND, minor gravel, Driller cut w/water. \mathbb{C} brown, unconsolidated Md-FN. 3.2 105 CLAY and SAND; brown, Md-FN, unconsoli-Cdated, drv.

CLAY, SAND and GRAVEL; Md-FN, unconsolidated, drv, brown, subangle to angular.

CLAY, SAND, GRAVEL; same.

C

C)

84 11:54,6

Trace water (?) from 115-120'.

Driller cut w/water

2.1

160

Log of Drilling Operations

Boring or Well No. RB-25 Sheet 4

Location Fai	r North	east Corne	er of	Flightline
Grid Cell				
Coordinates	x	14,050'		
	у	24,160'		

Ground Level Elevation: apx.72 ft. MSL (topo).

Project McClellan AFB IRP Phase II Beginning_ 31 August 1984 1 September 1984 of drilling operation Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Rig and Operator Prill Tek D40K/S. Smith Log Recorded By R.A. Belan

ID No. of Sample Taken Depth (ft) Lithologic Description Remarks 120 0.5 C SILT and CLAY; brown, unconsolidated, slight moisture. 125 C CLAY and SAND; VF, tan (sand), brown (clay), unconsolidated, dry. 130 SAND, SILT and CLAY; Fn-VF, tan (sand), C brown (clay), unconsolidated, dry. 135 0 (background) C CLAY; brown, unconsolidated, slight WL: 103' BGL: T: moisture. 19°C; C: 210; pH: 7.8. 140 RB-25-1 C CLAY, brown, slight moisture, unconsoli- Water (?) from 135-145'. dated. 5.9 145 C CLAY; brown, unconsolidated. 150 CSAND and CLAY; F, tan (sand), uncon-No obvious water. 2.3 solidated, brown (clav). 155 Dry at 160'. CLAY and SAND; Cs-VF, minor silt (white) (Driller blew out C, tan (sand) dry, unconsolidated. hole - no water.)

R	A	D	4	A	N
COD		471	0.	•	

Log of Drilling Operations

Boring or Well No. $\frac{66-25}{2}$ Sheet $\frac{5}{2}$ of $\frac{3}{2}$

Location Far	Northeast	Corner	of	Flightline
Grid Cell1	.5:25			
Coordinates	х	14,050'		
	v	24,160		

Project McClellan AFB IPP Phase II

Beginning 31 August 1984 and end

1 September 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Type Drill Big and Operated Fill Tek D40K/S. Smit

Ground Level Elevation: apx.72 ft. MSL (topo). Log Recorded By R.A.

Type Drill Rig and Operator Drill Tek D40K/S.Smith Log Recorded By R.A. Belan

				Log Hecorded By K. N. Bel	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160 - - - 165	С	RB-25-2		SAND and CLAY; Md-VF, mottled tan- brown, micaceous (gold).	WL: 107' BGL. T: 21 1/2°C; C:750; pH: 8.2.
170	С			CLAY and SAND, same, dry.	Driller cut w/water.
- - - - - 175	С			CLAY and SAND, same.	Driller cut w/water.
180	С			CLAY; brown, unconsolidated.	Driller cut w/water
 - - - - - -	С			CLAY; brown, dry, unconsolidated.	detected at 180' - with E-line Water at approx 187'.
190	Ċ	RB-25-3		SAND, Md-VF, minor clay, mottled tan, micaceous (gold), makes steady water. (187-190' sand).	Fluid level: 118' _ BGL; T: 21°C; C:330; pH: 8.3.
199	C			CLAY, brown, unconsolidated, dry. Total depth: 195 ft.	Water from 187-195'
200)				Grouted hole throughdual tubes w. 43 sacks Portland Cement Type I & II

500.01 48 6

Log of Drilling Operations

Boring	or Well	No RI	3-26
Sheet	1	of	5

Location Sou	th of Bldg	1440	
Grid Cell			
Coordinates	x	16,990'	
	.,	10 /90	

Project McClellan AFB IEP Phase II

Beginning 30 August 1984 and end

31 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 (ft)

Ground Level Elevation:apx.87 ft.MSL (topo).

Type Drill Rig and Operator Drill Tek D40K/S.Smitl Log Recorded By R.A. Belan

				Log necolded by	
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
- 5	G			SOIL; silt, clay, dry, unconsolidated, tan.	Drilled by the dual_tube air rotary method. OVM (ppm) 0.1 (background)
10	С			CLAY; dry, brown (driller cut w/water).	-
15	С			SAND; Fn-VF, unconsolidated, dry, brown.	5.0
20	С			SAND and SILT; Fn-VF, unconsolidated, dry, brown.	0.5
25	С			CLAY, slightly moist, unconsolidated, brown.	48.0
30	С			SILT and SAND; Fn-VF, unconsolidated, dry, tan.	12.5
- 35	С			SILT and SAND, VF, unconsolidated, slight moisture, tan.	3.2
	С			SILT and CLAY; slight moisture, red- dish brown, unconsolidated.	1.5

Log of Drilling Operations

Boring or Well No. RB-26 Sheet __

Location Sou	th of Blo	dg. 1440	 _
Grid Cell	17:20		 _
Coordinates	×	16,990'	_
	V	19,480	

Project McClellan AFB IRP Phase II 30 August 1984 Beginning___ 31 August 1984 of drilling operation Sampling Interval (Estimated) Composite 5

		у	17,400	Sampling Interval (Estimate	ed)(11)
Grout	nd Level	Flevat	ion: a <u>px</u> .	.87 ft.MSL (topo). Type Drill Rig and Operato Log Recorded By <u>R.A. Be</u>	
Depth (ft)	Type of Sample Taken	ID No of Sample Taken	Graphic Log	Lithologic Description	Remarks
	С			CLAY; hard, unconsolidated, brown.	Driller had to cut w/water.
- - - - 50	С			CLAY, same.	1.5
- - - - - 55	С			CLAY, same.	3.5
- - - - 60	С			CLAY and SAND, VF, unconsolidated, brown.	Driller had to cut w/water.
- - - 63 -	С			CLAY and SAND, same.	-
- - - - 70	C			CLAY and SAME, same.	1.0
- - - - 75	С			CLAY and SAND, same.	1.0
 	С			CLAY, hard, dry, unconsolidated.	

R	ADIA	an		Log of Drilling	<u> </u>	etof
Grid Coor	Cell1/ dinates	xy	16, 19, ion: apx	990'	Sampling Interval (Estimate	of drilling operation ed) Commosite 5 (ft) Drill Tek D40K S.Smith
Depth (ft)	type of Sasple Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks
30 - - - - - -	t)			SAND and CLAY, ta	un, Fn-VF, unconsolí-	-
- - - - - - - - - - - - - - - - - - -	C			CLAY; brown, unce	onsolidated.	4.4 (Background): 4.4, it's been raining.
- 35	C			CLAY and SAND; VF brown.	, unconsolidated,	
- - - - - - - - - - - - - - - - - - -	C			CLAY and SAND, sa	me.	
_ _ 105	C			SAND and CLAY; br Med-FN.	own, unconsolidated,	
_ _ 	C.			CLAY and SAND, Fn clay-hard, brown.	-VF, unconsolidated,	
- - - -	67			CLAY, reddish bro	wn, dry.	
 - - 	(1)	RB-26-1		CLAY and SAND; Fn brown.	-VF, unconsolidated,	9.8 Water: T: 'C; C: 170; pH: 7.3. Very little = water produced.

Log of Drilling Operations

Boring	10	Well	No.	RI	3-26
Sheet	_			of_	j

Location_Sc	outh of	Bldg. 1440	
Grid Cell	7:20		
Coordinates	х	16,990'	
	у	19,480'	

Project McClellan AND IMP Phase TI Beginning 30 August 1984 and end 31 August 1984 of drilling operation

Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operato Prill Tek D4Ck, S. Smith

Ground Level Elevation: apx.87 ft.MSL (topo).

Log Recorded By $rac{R\cdot A}{\cdot}$ Belan		Log	Recorded	Ву	R.A.	Belar	
---	--	-----	----------	----	------	-------	--

Depth (ft)	Fyne of Sample Taken	ID No of Sample Taken	Graphic Log	Lithologic Description	Remarks
120	С			SAND; C-F, unconsolidated, mottled, tan.	9.9
130	С			SILT and SAND, VF, unconsolidated, dry.	7.7
135	С			SILT and CLAY; unconsolidated, slight moisture, brown.	12.6 7.9 (background)
	С	RB-26-2		CLAY and SILT, unconsolidated, brown, some moisture.	Water level: 117', T: 23°C; C: 150; pH: 7.4. Little water produced.
- - 143	С			CLAY and SILT; same.	-
- : 30	()			CLAY,: slight moisture, brown.	8.2
	C			CLAY; dry (?), brown.	8.0
190	C			CLAY and SILT; hard, dry, brown.	No apparent water.

Log of Drilling Operations

Boring	or Well	No. RB	<u>-26</u>
Sheet	5	of_	5

Location Soi	ith of Bldg. 1440	Project McCle
Grid Cell		Beginning_30
Coordinates	x 16,990'	31 Augus
	y 19,480'	Sampling Inter

ellan AFB IPP Phase II of drilling operation rval (Estimated) Composite 5

Ground Level Elevation: apx.87 (t.MSL (topo). Type Drill Rig and OperatorDrill Tek D40K/S.Smith Log Recorded By R.A. Belan

				Log Hecorded By K.A. Bell	Log Hecorded By K.A. Betan			
Depth (ft)	Tvņe of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks			
160 - - - - 165	С			SAND, CLAY and GRAVEL; Md-FN, unconsolidated, no water, brown. Silt (white).	5.0 1.2 (background)			
- - - - -170	С			CLAY and SILT; minor sand, Fn, Brown, unconsolidated, dry.	2.5			
- - - - 175	С			CLAY; minor sand, Fn-VF, brown, uncon-solidated, dry.	-			
- - - 180	С			CLAY, same.	-			
- - - 185	C			CLAY; same. Possible trace water.	Driller had to use water to cut)			
- - - 190	C			CLAY; same.	-			
- - - - 195	C	RB-26-1	3	CLAY; same.	Water level: 122', BGL (rose quickly). T: 21°C; C: 200; pH: 7.5.			
- - - 200	С			SAND and CLAY; Vf-Fn, brown, water, unconsolidated, micaceous (golden). Total Depth: 200 Feet	Grouted hole through dual tubes wapx. 36 sacks Portland Cemen Type I & 11			

R	ADI	AN		Log of Drilling		Boring or Well No. RB Sheetof		
Grid Coo	ation Cell rdinates	x 1 y	3200 6000		Project McClellan AFB IPP Phase II Beginning 9-5-84 and end 9-6-84 of drilling operation Sampling Interval (Estimated) Composite 5 (ft)			
Grou	ind Level	l Elevat	ion: _	55 ft.MSL (topo).	Type Drill Rig and Opera Log Recorded By Wood		ic CP2 <mark>0</mark> 0 H <u>ors</u> t	
Depth (ft)	Tvpe of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks		
- -						ovm(ppm)		
- - - 5	С			Highway base mate	erial	0.0	1	
- - - 10	С			CLAY: Sandy, red	idish brown	0.10		
- - -	С			CLAY: Silty, sar	ndy, reddish brown	0.12	+	
	С			CLAY: Silty, sar	ndy, reddish brown	0.08	11111	
· · · 25	C			SAND: Silty, cla grained, tan	iyey, very fine	0.04		
- 30	С			SAND: Clayey, me grained, reddis	dium to very fine h brown	0.02	7 7 7	
-35	C	The state of the s		SAND: Clavev, me grained, brown	dium to very fine	0.01	7-1-1-1	
	С			SAND: Clayey, si grained, brown	lty, medium to fine	0.02	4 84 16 0.6	

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R	ADI	AN		Log of Drilling	Operations	Borii Shee	ng or Well Noof	2 <u>7</u> 5
Grid Coor	tion Cell dinates	x 13 y 6	,7 2200 0000		Tuna Daill Bug as	al (Estimate)	P Phase II of drilling or composite 5 chicago Pneuma	(ft)
Depth (ft)	vne of Sample Taken	ID No. of Sample Taken	Graphic go Log :		Log Recorded B	W. Boett	ner \ Remark	<u> </u>
- - - - - - - - -	C	_		SAND: Silty, cla medium grained,		≥ to	0.0	
- - - - 50	С			SAND: Gravelly, very fine grain		irse to	0.0	1
- - - - - - - - -	C			SAND: Micaceous grained, brown		ry fine	0.01	1
— — — — mi)	C			CLAY: Sandy, mi	caceous		0.04	
- - - - 65	С			SAND: Silty, fi brown	ne to very fin	e grained,	0.0	
- - - - - - 70	С			SAND: Silty, fi brown	ne to very fin	e grained,	0.0	1
	C			SAND: Micaceous grained, brown	, line to verv	tine	0 04	1
- - - - -	С			SAND: Silty, cl grained, brown		very (ine	0.02	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

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R	ADIA	AN		Log of Drilling	•	oring or Well No. RB 27 neet $\frac{3}{2}$ of $\frac{5}{2}$,		
Grid Cooi	ationCellrdinates	x 1 y	4,7 3200 6000	55 ft.MSL (topo).	Beginning 9-5-84 and end 9-6-84 of drilling operation Sampling Interval (Estimated) Composite 5 (ft) Type Brill Richard Operator Chicago Recurrents (CR2)				
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks			
80 - - - - - 85	С			SAND: Clayey, grained, tan	ravelly, very fine	0.0			
- - - - 90				SAND: Silty, fir	ne to coarse grained,	0.01			
- - - - 95	C				ery fine to coarse eous, tan to gray	0.0			
- - - - 100	С				edium to very fine eous, brown to gray	0.04			
- - - - 103	С			CLAY: Silty, sar	ndy, brown (moist)	0.02			
- - - 	С			CLAY: Sandy, pl	nstic, brown (moist)	0.0			
- - - - 115	С			CLAY: Sandv, gra	avelly, dark brown	0.02			
- - - - 120	C			CLAY: Sandy, pla	astic, dark brown	0.0	4 83 16560		

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Con	ADI	AN		Log of Drilling	Operations	Boring or Well No. RB 27 Sheet 4 of 5
Grid Coo	Cell_ rdinates	у	14, 7 13200 6000		9-6-84 Sampling Interval (Estin	and end of drilling operation nated) Composite 5 (ft)
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic us	55 ft.MSL (topo).	Log Recorded By We Bo	ator Chicago Pneumatic CP2 Dettner \B. norst
120	Tvpe Sam Ta	San Tak	Gra	Litholog	gic Description	Remarks
- - - - - 125	С			SILT: Sandy, cla	nyey, tan	0.0
- - - -130	С			SAND: Silty, cla fine grained	ayey, fine to very	0.02
- - - 135	C			SAND: Silty, cla	yey (moist)	0.0
- - - ! 40	С			SAND: Silty (moi	st)	0.0
- - 145	С			SILT: Clayey, sa	ndy, brown	0.0
- - - - - -	С			SILT: Sandy, cla	yey, plastic, brown	0.01
-133	C			SILT: Sandy, clav grained, brown	ev, fine to medium	0.02
160	С	- - - - - -		SILT: Sandy, clay	ey, brown	Water sample at 160' pH = 5.2 Conductivity = 280 Temperature = 16°C

R	ADIA	AN	_	Log of Drilling	Operations	Bor She	ing or Well No. Ret	3 27
Cool	rdinates	x 132 y 60	00	5 ft.MSL (topo).	Sampling Interva	9-5-84 9-6-84 al (Estimate nd Operator	a of drilling ope ed) <u>Commosite 5</u> Chicago Phocumat	eration (ft) is GP2000
Dept (ft)	Type of Sample Taken	ID No. of Sample Taken			Log Recorded B	W. Boett	Remarks	
160 - - - 165	С			SAND: Silty, cla grained, brown		edium	0.02	
- - - 170	С			SAND: Silty, cl. grained, brown		nedium	0.0	
 175	С			SAND: Silty, cla grained, brown	ayey, fine to m	nedium	0.0	1 1 1
_ _ _ 180	С			SAND: Clayey, si grained, brown	ilty, fine to π	nedium	0.0	
- - - 185	С			SAND: Silty, cla grained	yey, fine to m	edium	0.0	1
- - - - - - 190	C			SAND: Silty, cla grained	yey, fine to m	edium	0.01	1
- - - 195 - - - -	С			SAND: Clean, mid medium grained Total Depth: 195	caceous, fine t	O	0.01 Water sample a pH = 6.8 Conductivity = Temperature = 0-195' 4½" hold Grouted hole tr dual tubos w/3 sacks Portlind Type 1 & 11	240 15°C e 1 rough 7

Log of Drilling Operations Log of Drilling Operations Location Westside of SAC Horseman Association Grid Cell 16:08 Coordinates x 15,720' Beginning 4 September 1984 and end 5 September 1984 of drilling operation y 7,040' Sampling Interval (Estimated) Commosite 5 (ft) Ground Level Elevation: apx.62 ft. MSL (topo). Type Drill Rig and OperatorDrill Tek D40K S. Smit Log Recorded By R.A. Belan

Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
1)	G			SILT and SAND; brown, unconsolidated, dry.	Drilled by the dual tube air rotary method. OVM (ppm) O (background)
10	С			SILT and SAND; Cs-VF, minor gravel, tan ang-subang, unconsolidated, dry.	
15	С			CLAY and SAND; Fn(?), dry, unconsoli- dated, brown.	Driller cut w/water- 0.5
20	С			SAND; Md-Fn, ang-subang, tan, uncon-solidated, dry.	1.5
25	C			SAND; tan, dry, unconsolidated.	6.6
30	C.			CLAY and SILT; brown, dry, unconsoli-dated.	25.0
- 55	(;			CLAY; brown, dry, unconsolidated.	Driller out w/water.
.0	C			CLAY; brown, dry, unconsolidated.	

R	A	A	N

Log of Drilling Operations

Boring or Weil No. RB-28
Sheet 2 of 5

Location West	side of	SAC Horseman	Association	Project McClellan AFB In	P Phase II
Grid Cell1				Beginning 4 September 1	
Coordinates	X	15,720		5 September 1984	of drilling operation
	у	7,040 '		Sampling Interval (Estimated) Composite 5 (ft)
Cround Lava	l Flowat	ion: anv.62 fr	MSI (taba).	Type Drill Rig and Operator	Drill Tek D+OK/S.Smi

			`	Log Recorded By R.A. Bel	an
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
40 - - - - - - - - - - - 5	C			SAND; Cs-Fn, mottled, brown, ang-subang, dry, unconsolidated.	0.4
- - - 50)	С			CLAY and SILT; brown (clay), tan (silt), dry, unconsolidated.	0.7
- - - - - 55	С			CLAY; hard, dry, grayish brown, uncon- solidated.	Driller cut w/water.
- - - - nU	С			CLAY; hard, dry, grayish brown, uncon- solidated.	Driller cut w/water- 100 -
- - - - - - -	C			CLAY and SAND; Fn, grayish tan, plastic, dry, unconsolidated.	83
7.0	C			CLAY, grayish tan, slight moisture, plastic, unconsolidated.	11.0
- ;	C			CLAY; minor sand, brown, dry, uncon- solidated.	54
- - -	(.			CLAY; hard, drv, brown, unconsolidated	8.8

Boring or Well No. RB-28 RADIAN Sheet _____ of Log of Drilling Operations Location Westside of SAC Horseman Association Project McClellan AFB IPP Phase II Grid Cell_ 16:08 Beginning 4 September 1984 15,720 Coordinates 5 September 1984 _of drilling operation Sampling Interval (Estimated) Composite 5 (ft) Type Drill Rig and Operator Drill Tek 040K/S.Smith Ground Level Elevation: apx.62 ft. MSL (topo). Log Recorded By R.A. Belan Type of Sample Taken Lithologic Description Remarks 80 CLAY; plastic, slight moisture, brown, С unconsolidated. CLAY; plastic, slight moisture, brown, C 60.3 unconsolidated. -90 C CLAY; same. 12.2 95 C CLAY; same, very small amount of water (not enough to sample). . () () Driller cut w/water. SAMD and CLAY; Fn-Vf, plastic, uncon- \mathbf{C} solidated. 8.7 -105 SAND and CLAY; same. C CLAY; drv, unconsolidated, mottled, C reddish-brown (iron oxide color). W.L.: 102 1/2' BGL. SAND and CLAY; same, some iron oxide T: 22°C; C: 250;

cementing of sand grains (slightly un-

consolidated, C-F (sand).

RB-28-1

pH: 7.0. Water

R	ADIA	AN		Log of Drilling	Char	ng or Well No <u>RB-28</u> etof		
Location Westside of SAC Horseman Association Grid Cell 16:08 Coordinates x 15,720' 5 September 1984 of drilling operat y 7,040' Sampling Interval (Estimated) Composite Type Drill Rig and Operato Prill Tek D40K S.S. Log Recorded By R.A. Belan								
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description	Remarks		
120	С			SAND; Fn-VF, tan,	unconsolidated, wet.	Sieve analysis indicates mostly silts.		
_ _ 130	С			CLAY and SILT; by (silt), dry (silt) solidated.	rown (clay), tan t), moist (clay), uncon-			
135	С			SILT and CLAY; b: slightly moist (rown, unconsolidated, no free water).	130		
- - - i '	C			CLAY; brown, unc no free water.	onsolidated, plastic,	1.0		
	C			CLAY; brown, unc (no free water).	onsolidated, plastic	0.3		
- 15	C			CLAY; brown, sli sand (VF), uncon	ghtly moist, minor solidated.			

Solidated, dry (?).

CLAY and SAND; brown, Fn-VF, unconsolidated, no obvious water.

WI: 105' BGL; U: 24°C; C: 200; pH: 7.2.

CLAY and SILT; brown and tan, uncon-

RB-28-2

0.4

5 81.2 Th. 4.61

Log of Drilling Operations

Boring o	r Well	No RB	-28
Sheet _	5	of	3

Location Wes	stside_	of SAC	Horseman	Association
Grid Cell				
Coordinates	x	1	5.720'	
	у		7.040	

Project McClellan AFB IRP Phase II Beginning 4 September 1984 5 September 1984 of drilling operation Sampling Interval (Estimated) Composite 5 Type Drill Rig and Operator Drill Tek D40K.S.Smit

Ground Level Elevation: apx.62 ft.MSL (topo).

Log Recorded By R.A. Belan

Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
160 - - 165	С			SILT and SAND; dry, tan, minor clay, unconsolidated.	0.2
170	C			CLAY; brown, plastic, unconsolidated, no free water.	0.5
173	С			SILT and CLAY; tan, dry, unconsolidated.	No OVM response.
- 180	С	RB-28-		CLAY; brown, some moisture, unconsolidated. SAND; minor gravel, minor clay, Md-Fn, mica (gold, unconsolidated), lots of	WL: 103' BGL; C: 220; pH: 7.0.
133	С			water.	
190	С			CLAY and SAND; brown, unconsolidated, dry (?).	
195	С			CLAY and SAND; brown, unconsolidated, dry (?).	
200	C			CLAY and SAND; brown, plastic, unconsolidated. No obvious water. Total Depth: 200 Feet	Grouted hole throughdout tubes w 34 sacks Portland Cement Type I & II

R	ADIA	AN			ng or Well No. <u>RB 29</u> et <u>1</u> of <u>5</u>
Grid	ition Cell rdinates	x 105	5 50 50		and end
Grou	ind Level	l Elevat	ion: <u>5</u> 5		<u> Chicago Pneumatic CP2</u> 004
Depth (ft)	Tvne of Sample Taken	ID No. of Sample Taken	Graphic Log	Lithologic Description	Remarks
-					ovm(ppm)
- - 5	С			Highway base material	0.0
- - - - - 10	С			SAND: Silty, clayey, fine to very fine grained, brown	0.22
- - - - 15	С			SAND: Silty, fine to very fine grained, brown	0.16
_ _ _ 20	С			SAND: Silty, fine to very fine grained, brown	0.2
	С			SAND: Silty, clayey, fine to very fine grained, tan to brown	0.14
	С			SAND: Silty, fine to very fine grained, tan	0.08
— — — — 35	C			SILT: Sandv, fine to very fine grained, tan	0.18
<u>-</u> - - -	С			SAND: FeOH+ staining, trace of clay	0.04

R	ADIA	AN		Log of Drilling	Operations	O 1	ing or Well No. 29 set 2 of 5	
Location			50		Sampling Inte	9-5-84 ervai (Estimate	np Phase IIand endof drilling operation ed) Commosite 5(ft	ר נו
Grou	ind Level	l Elevat	ion: 55	ft.MSL (topo).	Type Drill Rig	and Operatod By <u>W. Boet</u>	<u>Chicago Pneumatic CP</u>	2000
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholog	gic Description		Remarks	
- 40 - - - - 45	C			SAND: Clayey, fi micaceous, brow		n grained,	0.08	
- - - - - - - - - - 50)	С			SAND: Clayey, fi micaceous, brow		n grained,	0.06	
- - - - - - 55	C			SAND: Clayey, me	edium to ver	y fine	0.12	
- - - - -	C			CLAY: Sandy, si.	lty, brown		0.10	1 1 1 1
- - - - -55	С			CLAY: Sandy, si	lty, brown		0.02	
70	C			SAND: Clayev, v	ery fine gra	ined, tan	0.04	
_ _ _ 	Ç			SILT: Sandy, ol	ayey, tan		0.28	7777
	C			SAND: Silty, el brown	avev, plasti	ic, dark	0.04	

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R	ADIA	an		Log of Drilling	<u> </u>	ng or Well No. <u>29</u> et3of5
Grid Coor	dinates	x 10 y 4	5 550 850	ft.MSL (topo).	Project McClellan AFR TE Beginning 9-4-84 9-5-84 Sampling Interval (Estimated Type Drill Rig and Operator, Log Recorded By M. Boett	and end of drilling operation d) Composite 5 (ft) Chicago Pneumatic CP2D0
Depth (ft)	Type of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
80 - - - - - - - 35	С			SAND: Clayey, fi dark reddish bi	ine to medium grained, rown	0.06
90	С			SAND: Silty, cla fine grained, t	ayey, medium to very tan	0.02
	C			SILT: Clayey, p	lastic, sandy (moist)	0.04
- - - -	C			SAND: Clean, med tan	dium to coarse grained,	0.01
- 19 ³	C			SILT: Sandy, cla gray	ayey, plastic, tan to	0.0
				CLAY: Sandy, fi brown	ne to very fine grained,	0.01
-11	C.			SAND: fine to v micaceous, tan	ery fine grained.	0.02
<u>-</u> -	C			SAND: Silty, fi		0.04

R	ADIA	AN		Log of Drilling	0	ng or Well No. <u>29</u> et <u>of 5</u>
Grid Coor	dinates	x 105 y 48	550 350	ft.MSL (topo).	Sampling Interval (Estimate	of drilling operation of drilling operation of Composite 5 (ft) Chicago Pneumatic CP200
Depth (ft)	Tyne of Sample Taken	ID No. of Sample Taken	Graphic Log	Litholo	gic Description	Remarks
120 - -	C			CLAY: Sundy, pla	astic, micaceous, brown	0.0
- 125 - - - - 130	С			SAND: Silty, fir brown	ne to medium grained,	0.01
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	C			SAND: Silty, cla very fine grain	nyey (plastic), fine to ned, tan	0.04
- - - - -40	C			SILT: Sandy, ela	ayey, tan	0.08 Water sample at 140 pH = 6.0 Conductivity = 300 Temperature = 20°C
145	С			SAND: Silty, cla grained	ayey, fine to medium	0.02
150	С				clayey (plastic), se grained, dark brown	9.02
_155	C			SILT: Sandv, cl	lavev, reddish brown	0.04
150	C			SAND: Gravelly, grained, micac		0.0 Water sample at 160 ¹ pH = 6.2 Conductivity = 280 femperature = 20°C

R	ADIA	ZN		Log of Drilling Operations Boring or Well No. 29 Sheet of of of 1			
Location					Project McClellan APS TE Beginning 9-4-84 9-5-84 Sampling Interval (Estimated Type Drill Rig and Operator) Log Recorded BW. Esetts	of drilling operati d) <u>Composition</u> <u>bicago Progra</u> tic (ion (ft)
Depth (ft)	Type of Sample Taken	Sample Taken Graphic Log		Litholog	gic Description	Remarks	
160 - - 165	С			SAND: Silty		0.01	1
170	С			SAND: Silty, cla	ıyey	0.00	
175	С			SAND: Clayey (p) medium grained		0.02	
	C			CLAY: Sandy, fir	ne to medium grained,	0.00	
1.6.7	Ċ			SAND: Silty, fir brown	ne to very fine grained,	0.02	
	(,			SAND: silty, figgrained, brown		0.01	
-: -	6			CLAY: Sandy, si Total Depth: 19		0.04 0.02 0-195' 4½" hole Fronter to be the multimes w 26 theks don't and do Type 1 & 11	⊢ † ‡

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APPENDIX 5-D

Results of Grain-Size Distribution
Analyses of Soil Samples



File No. 1604-1 27 August 1984

E. Wayne Pearce Radian Corp. 3401 La Grande Boulevard Sacramento, CA 95823

Subject: Grain Size Distribution Test Results

Gentlemen:

Enclosed are the results of the first set of samples (37 in all) submitted to our laboratory on 13 August 1984.

Very truly yours,

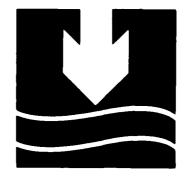
ANDERSON GEOTECHNICAL CONSULTANTS, INC.

Gery F. Anderson, P.E., C.E.G.

President

Enclosure: Test Results

Mailing Address: P.O. Box 420878 Sacramento, CA 95842 • Sacramento County: (916) 969-8883 Business Address: 631 Commerce Drive, Roseville, CA 95678 • Placer County: (916) 786-8883



File No. 1604-1 31 August 1984

E. Wayne Pearce Radian Corp. 3401 La Grande Boulevard Sacramento, CA 95823

Subject: Grain Size Distribution Test Results

Gentlemen:

Enclosed are the results of the second set of samples (14 in all) submitted to our laboratory on 20 August 1984.

Very truly yours,

ANDERSON GEOTECHNICAL CONSULTANTS, INC.

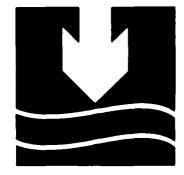
Gery F. Anderson, P.E., C.E.G.

President

GFA/dmk

Enclosure: Test Results

Mailing Address: P.O. Box 420878 Sacramento, CA 95842 • Sacramento County: (916) 969-8883 Business Address: 631 Commerce Drive, Roseville, CA 95678 • Placer County: (916) 786-8883



File No. 1604-1 10 September 1984

E. Wayne Pearce Radian Corp. 3401 La Grande Boulevard Sacramento, CA 95823

Subject:

Grain Size Distribution Test Results

Gentlemen:

Enclosed are the results of the third set of samples (37 in all) submitted to our laboratory on 27 August 1984.

Very truly yours,

ANDERSON GEOTECHNICAL CONSULTANTS, INC.

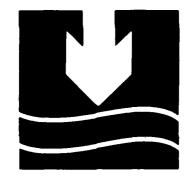
Gery F. Anderson, P.E., C.E.G.

President

GFA/dmk

Enclosure: Test Results

Mailiné Address: P.O. Box 420878 Sacramento, CA 95842 • Sacramento County: (916) 969-8883 Business Address: 631 Commerce Drive, Roseville, CA 95678 • Placer County: (916) 786-8883



File No. 1604-1 24 September 1984

Radian Corporation Attention: Rick Belan 8501 Mopac Boulevard Austin, TX 78766

Subject: Grain Size Distribution Test Results

Gentlemen:

Enclosed are the results of the final set of samples (29 in all) submitted to our laboratory on 7 September 1984.

Very truly yours,

ANDERSON GEOTECHNICAL CONSULTANTS, INC.

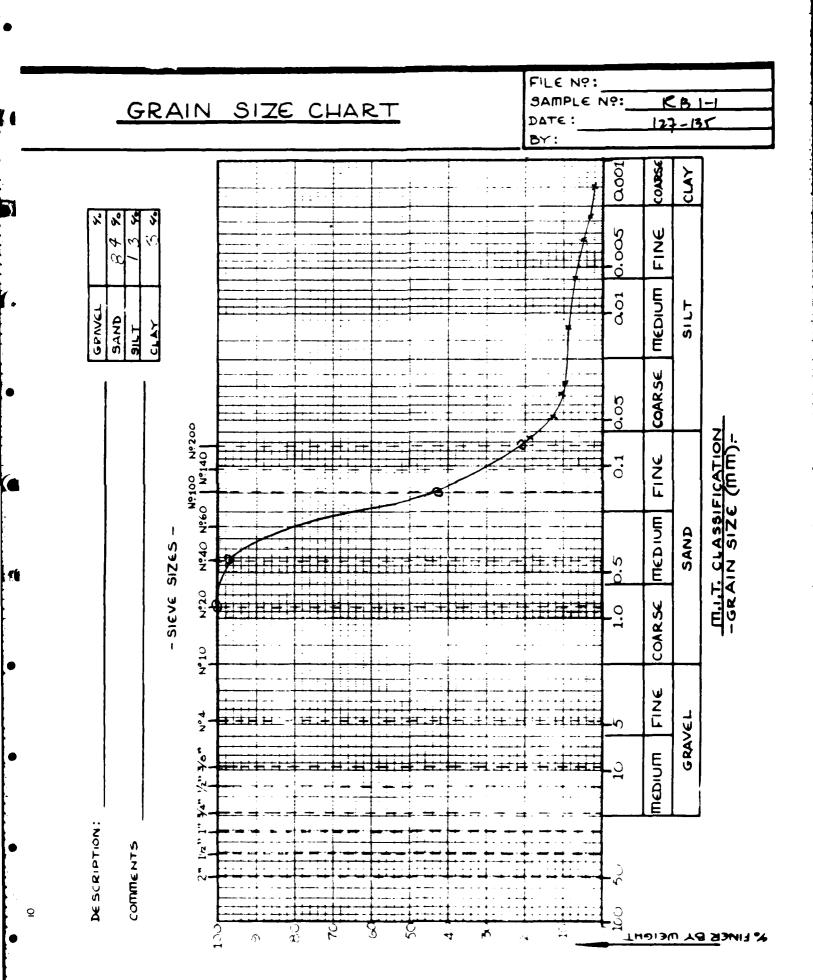
Gery F. Anderson, P.E., C.E.G.

President

GFA/mkb

Enclosure: Test Results

Mailing Address: P.O. Box 420878 Sacramento, CA 95842 • Sacramento County: (916) 969-8883 Business Address: 631 Commerce Drive, Roseville, CA 95678 • Placer County: (916) 786-8883



RBI-

127-135

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D	422	-6	3.
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			A.S.I.	····	122-6	· · · · · · · · · · · · · · · · · · ·				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	τεπ Ρ . ℃	R + = CrrCd	METER	1	K	N (%)	2,00
		1/~	9		9.4	0.067	14.7	10124	18.8	
		1	6		6.4	4048	15,2	4	12.8	
		~	7		1.4	U.034	15,3	1,	10.8	
		3	4.8	28	5,7	4028	15.3	"/	10.4	
		14	4.5		4.7	0013	15.5	4	9.4	
		70	3.0	28	3.4	0.005-9	15.6	"	6.8	
		230	2.5	265	7.3	40033	15.7	0.0127	4.6	
		470	25	25	1.6	0.0024	15.7	.0129	3,2	
		1130	1,0	27	1,0	00015	16.0	10/26	2.0	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < N960 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{US}=R$
REMARKS:

RB1-1

FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10				
NO.20	_ 0 _			5000
NO.40	1.6	7.2		2
NO.60				
NO.100	27.1	J 4.2		4
NO.140				
NO.200	10.6	2/2		
PAN	, 5.7	21.4		
TOTAL	520	/		
REMARKS _				

FILE NO: RB 1-2 SAMPLE NO: GRAIN SIZE CHART 160-165 0001 COARSE CLAY 28% 45% FINE 0.005 MEDIUM 001 SILT GRAVEL SAND SILT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-PINA **MEDIUM** SAND **SIZES** - SIEVE COARSE 1.0 N. 10 FINE GRAVEL TEDIUM DE SCRIPTION: COMMENTS * FINCE BY WEIGHT

RB 1-2

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M.	D422-63.
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	A.S.T.M. D422-65.									
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	RH= CMCd	DIA- METER (m m).		K	Z (%)	N ₁ (%)
		1/2	40				9,6	, 0/24	80.8	
			37		37.4	0.040	10.1	4	74.8	
		V	345		74.9	0.028	10.4	,	69.8	
		3	33,5	77	33.9	0.024	10.6	4	67.8	
		14	31		31.4	0011	11.1	4	62.8	
		50	27	-	27.4	0,000	11.7	"	54.8	
		100	24	24	24.4	0.0043	12,2	11	48.8	
		260	21	265	20.8	0.0027	12.7	10127	.41.6	
		500	19	25	18.1	0.0020	13.0	.0/29	362	
		1160	15	17	15	0.001K	13.7	10/26	30,0	ļ
								ļ		
									ļ	
										ļ
								<u> </u>		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < N960 SIEVE :
% < Nº 60 SIEVE : N1=(% < Nº 60) N=N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{US}=R$
REMARKS:

RB 1-2 140-145

FILE NO:	
SAMPLE Nº:_	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	0			/
NO. 20	0 - /	0.3		23
NO.40	1. 4	0.3		
NO.60				
NO.100	1,2	7		45-
NO.140				
NO.200	3.1	<i>,</i> 1		
PAN	42 /	119		
TOTAL	47.7	1000		

REMARKS

FILE NO: RB 1-3 SAMPLE NO: GRAIN SIZE CHART 180-190 DATE: 0001 COARSE CLAY FINE 0.005 001 **MEDIUM** GRAVEL COARSE 0.05 Nº100 Nº200 Nº60 | Nº140 | MILT. CLASSIFICATION -- GRAIN SIZE (MM)-FINE **MEDIUM** SAND SIEVE SIZES COARSE FINE GRAVEL THEDICAL DESCRIPTION: % FINER BY WEIGHT

RB 1-3 180-190

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.	m	D	42	2-	63	
~~~					$\mathbf{e}$	

			<u> </u>		14 K K T C					
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).	1	K	2%	Z, (%)
		1/2	34		343	aw7	10.5	,0125	78.6	
		1	32		32.3	0.041	10.9	4	64,6	
		γ	29		29.3	0030	11.4	"	58.6	
		3	27	27.6	27.3	0.025	11.7	7	54.6	
		14	21,5	1	21.8	0.012	1216	",	43.6	
		42	17.2		17.5	0.0070	13.3	"	35.0	
		88	12	28	15.4	0.0049	13,7	. 0/24	30.8	
		355	11	26	10.6	0.0025	14,3	7210.	21,2	
		1310	70	28	7.4	0.0013	15.0	10124	14.8	
								,		
				,						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

FILE NO:
SAMPLE Nº:
DATE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.			_	
1 IN.				
3/4 IN.				
1/2 IN.	_			
3/8 IN.				
NO. 4				
NO. 10				
NO. 20	0.~	04		<i>j. i</i> ?
NO.40	1. /. /	2 2		3.2
NO.60	<u> </u>			
N0.100	57	۷.		
NO.140				
NO.200	4.5	7		
PAN	> -			
TOTAL	200			

FILE NO: SAMPLE NO: RB2-1 GRAIN SIZE CHART 90'-100' DATE: CAY FINE MEDIUM 000 SILT GPAVCL SAND COARGE -GRAIN SIZE (MM)-FINE **MEDIUM** SAND S126S SIEVE COARSE GRAVEL K FINER BY WEIGHT

## 2-1

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.	m	$\mathbf{r}$	1.2	2-	6	ス
<u> </u>	8 I I.	u	<b>ムトム</b>	~-	v	$\sim$

A.S.I.III. D422-65.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH- CMCd	DIA- METER (M M).		K	N (%)	N ₁ (%)
		1/2	45		45	0053	8. t	6ءاں،	90	
			435	:	43.5	0038	9.0	1,	87	
		7	42		42	0027	9.2	4	84	
		3	41.5		41.5	0022	9.3	٠,	83	
		14	34.6	27	396	1.010	9.6	',	79.2	
		3~	37	_	37	00071	10.1	"	74	
		76	34,3	27	34.3	0047	10.5	v	64.6	
		170	30.0	26	29.6	0 0033	11.~	<b>جالا</b> .	59.2	<u>'</u>
		300	13.0	27	13.0	0 00 27	14.0	.0126	26	
		770	3.0	24	1.7	0.00/9	15.6	. 0130	3.4	
		1130	1.0	27	1.0	0:01	16.0	.0176	2.0	
		1350	0	26		11 00 14	16.3	.0127		
								<u></u>		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
ITENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

2-1

FILE Nº:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				·
NO. 10	0			
NO. 20	0.3			
NO.40	0.7			
NO.60	#			
N0.1∞	1			
NO.140				
NO.200	0.8			
PAN		•		
TOTAL	50.0			
REMARKS_				
			·	

FILE NO: SAMPLE NO: KB 2-2 GRAIN SIZE CHART 135-140 DATE: COATESE Q001 CLAY FINE 0.005 MEDIUM 001 SILT GPAVEL SAND COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND SIEVE SIZES COARSE FINE GRAVEL MEDIUM DE SURIPTION: K FINER BY WEIGHT

#### マーン |35'-140'

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D422-63.
----------	----------

			<u> </u>							
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	TEMP.	R 4,= Ru+ (CMCd)	DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	27.5		27.5	0.061	11.6	.هالا الماله	55	
		1	26		26	1043	11.9	•	52	
		z	24.5		24.5	0.031	12.1	1,	49	
		3	24		14	0 025	12.2	•	48	
		14	21	23	21	0.012	12.7	•,	42	
		17	195	-	19,5	0.0037	12.9	•,	39	
		72	17	27	17.0	00054	13,3	•,	34	
		165	14.5	74	14.1	00337	13.8	10127	28.2	
		300	13,6	27	13,0	0.0027	14.0	.0176	26	
		765	11,0	24	10.6	00018	14.3	. 0130	21,2	
		1145	9.0	27	9.0	0 0014	14.7	.0126	18	
		1345	45	16	8.1	0.0013	14,8	<b>بدان</b> .	16.2	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED = ; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº 60 SIEVE : N1 = (% < Nº 60) N =N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{US} = R $
REMARKS:
REMARKS:

2-2 135-140

FILE NO:
SAMPLE Nº:
DATE:
BY:

	V			
SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	1.6			
NO. 20	5.3			
NO.40	4.8			
NO.60				
NO.100	5.1			
NO.140				
NO.200	2.3			
PAN				
TOTAL	50.0			
REMARKS _				

FILE NO: RB 2-3 SAMPLE NO: GRAIN SIZE CHART 156-160 0001 COARSE CLAY FINE 0.005 MEDIUM 001 GRAVEL SAND COARSE 0.03 N°200 -GRAIN SIZE (MM)-FINE Nº100 **MEDIUM** SAND **S126S** SIEVE COARSE **MEDICA** DE SURIPTION: LHOISM AS BINE %

### 156-160'

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

A.S.T.M.	D422-	63
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			<u> </u>	<u> </u>	422-6	<u> </u>				
3TAD	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	1€mP.	RH= RH+ (Corcd)	METER		K	2%)	Z-(%)
		1/~	22		22.9	a 062	13.5	.0/23	45.8	
		1	20		20.9	0.044	12.9	1,	4/.8	
		~	18.5		19.4	0.032	13,4	٠,	38,4	
		3	17.5		18.4	4.026	13.3	4	48	
		14	14	24	14.9	0.0/2	13.8	4	29.8	
		42	9	-	8.1	0.0073	14.7	•,	16.2	
		150	5,0	24	4.9	00040	15.5	* _	9.8	
		390	4,0	27	3,9	U.0026	155	.0126	7.8	
		1350	3	26	3,4	9.0013	15.6	,0124	6.8	
				`						

SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

72 - 3

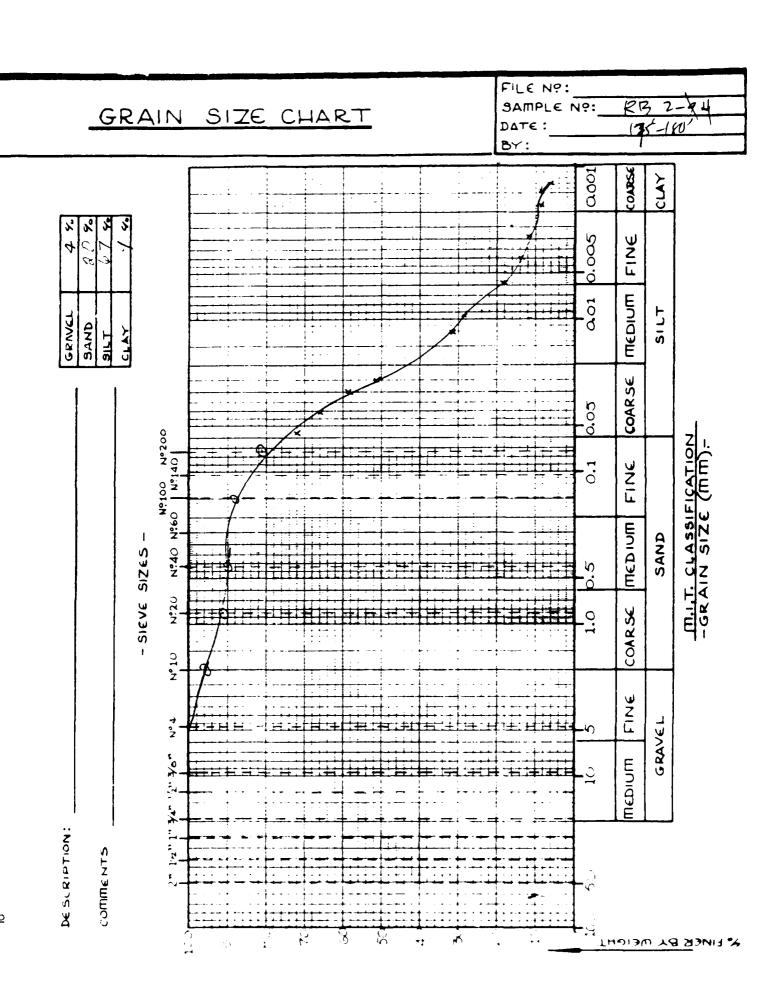
150-160

- SIEVE ANALYSIS -

76

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

SIEVE	DEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	4.0	8.0		92
NO. 20	3.8	7.6		84,4
NO.40	2.7	5,4		79.0
110.60				
N0.1∞	8.0	16.0		63.0
NO.140				
NO.200	57	[1.4		51.6
PAN	25.8	51.6		U
TOTAL	50.0	1000		
REMARKS		<del></del>		



#### 2-9 135-180

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D	42	2-	6	3
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			A.S.I.	111. 0	422-6	, <u>, , , , , , , , , , , , , , , , , , </u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	RH= CMCd	METER		K	N (%)	N, (%)
		1/2	36		36	0.057	10.0	.0176	72	
			33		33	1.041	10.7	٠,	66	
	,	2	29		29	0030	11.4	7	68	
		3	25.5		25.5	0,025	11.9	4	51	
		14	16		16.	0:12	13.5	',	32	
		24	14	27	14	0.0096	13,1	•	28	
		70	9.5	u	9.1	82000	14,6	.0127	18.2	
		160	7.2	26	6.8	00030	15.0	",	13.6	
		300	6.0	27	6.0	00023	15.7	.0126	12.0	
		76.	1.5	24	4.2	041000	15,3	.0130	8.4	
		1120	4.0	27	4.0	00015	15.5	.0126	8.0	
		1340	3,5	26	3.1	10014	15.6	.0127	6.2	
						<u> </u>	<u> </u>			

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED = ; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < ,Nº60 SIEVE :
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{US} = R \underline{\hspace{1cm}}$
REMARKS:

2-9 135-180

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

	<u> </u>			
SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	2.1			
NO. 20	2.2			
NO.40	0.7			
NO. CO				
NO.100	1.2			
NO.140				
NO.200	3.2	•		
PAN	J	•		
TOTAL	50,0			
REMARKS				
_				
		· · · · · · · · · · · · · · · · · · ·		

#### 1604-1 FILE NO: 3.11 SAMPLE NO: GRAIN SIZE CHART 951-130' BY: 0001 CLAY FINE 0.005 MEDIUM 001 GUNCL COARSE Nº60 | Nº140 | M.I.T. CLASSIFICATION -GRAIN SIZE (MM)-FINE **MEDIUM** SAND SIEVE SIZES COARSE GRAVEL THEDIUM

K FINER BY WEIGHT

DE SCRIPTION:

COMMENTS

3-2 95-130

FILE NO:	
SAMPLE NO:	_
DATE:	_
BY:	

A.S.T.M. D	422-63.
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			۲۱.۵.۱.		1220					
3TA0	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	RH+ Corld	DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	18	_	1064	18.4	13,2	.0124	36.8	
		1	16	)	1046	16.4	13.5	"	32.8	
		ν	14.5	_	1032	14.9	13.7	′,	29.8	
		3	14.0	/	1026	14.4	13.8	4)	28.8	
		14	140	28	、いして	12,4	14,2	4	24.8	
							(	4		
		114	7.5	28	1004	7.9	14.9	u	15.8	
	0/00	235	5.3	27	1003×	5.3	15.3	.ગાપ	10.6	
	0730	625	4,0	245	10020	3.0	15.5	,0130	60	
	1930	1345	/, 0	28	10013	1.4	16.0	0/14	2.8	
							<u> </u>			

DESCRIPTION:
SPECIFIC GRAVITY; GS: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{US} = R \underline{\hspace{1cm}}$
REMARKS:

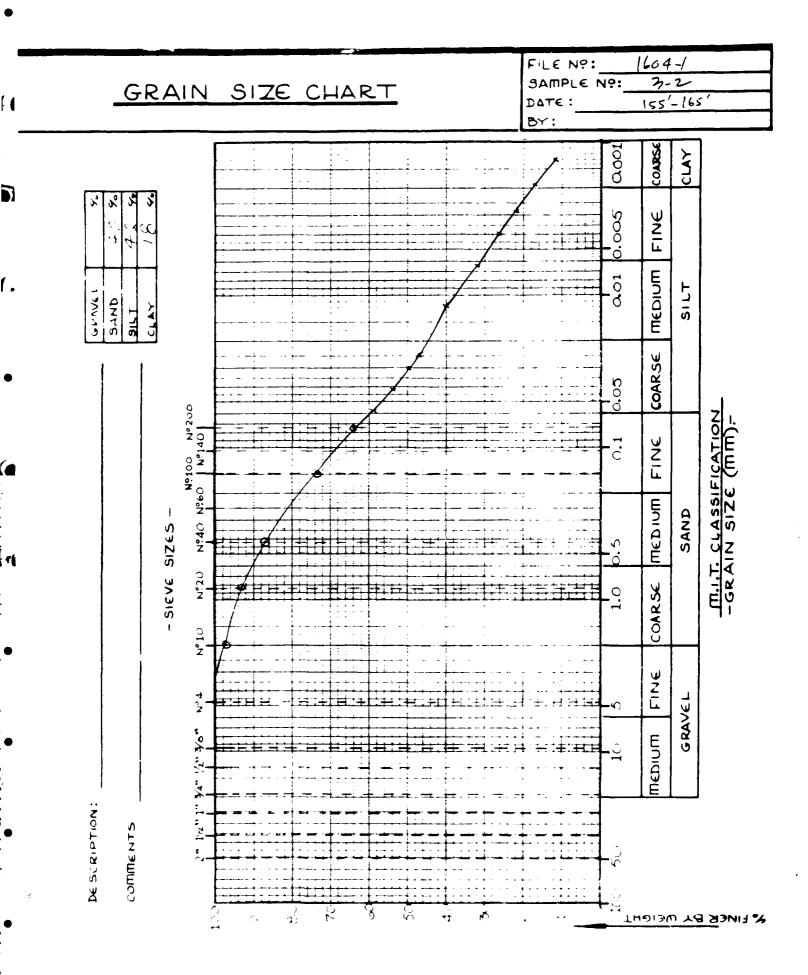
3-2 95-130

SAMPLE Nº:_____

BY:____

FILE NO:

3 IN.  2 1/2 IN.  2 IN.  1 1/2 IN.  1 IN.  3/4 IN.  1/2 IN.  3/6 IN.  NO. 4  NO. 10  C.9  NO. 20  25  NO. 40  NO. 40  NO. 60  NO. 100  / 58  NO. 60  NO. 100  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58  / 58	SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
2½ IN.  2 IN.  1½ IN.  1 IN.  3/4 IN.  ½ IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  25  NO. 20  25  NO. 40  NO. 60  NO. 100  /58	SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
2 IN.  1 1/2 IN.  1 IN.  3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  25  NO. 40  NO. 60  NO. 100  /58  NO. 60  NO. 100  /58  NO. 10	3 IN.				
1 ½ IN.  1 IN.  3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  C.9  NO. 40  NO. 40  NO. 60  NO. 60  NO. 10  NO. 10  NO. 10  NO. 60  NO. 10  NO. 60  NO. 10  NO	21/2 IN.				
1 IN.  3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  RO. 20  RO. 40  RO. 60  NO. 60  NO. 100  RO. 100	2 IN.				
3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  25  NO. 40  NO. 60  NO. 100  /58  NO. 100  /58  NO. 100  /58  NO. 100  NO. 100  /58  NO	1 1/2 IN.				
1/2 IN.  3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  RO. 20  RO. 40  RO. 40  RO. 60  RO. 100  RO. 100  RO. 60  RO. 100	1 IN.				
3/8 IN.  NO. 4  NO. 10  C.9  NO. 20  RS  NO. 4  NO. 40  NO. 40  NO. 40  RO. 40	3/4 IN.				
NO. 4  NO. 10  C.9  NO. 20  RS  SSC SC  NO. 40  NO. 40  NO. 60  NO. 100  NO	1/2 IN.				
NO. 10  C.9  NO. 20  R.S  S.C  NO. 40  S.C  NO. 60  NO. 100  NO. 100  NO. 100  NO. 100  NO. 100  NO. 100  NO. 200  PAN  TOTAL  SUU  SCO  FIGURE  FIGUR	3/8 IN.				
NO. 20 25 5.0 732 NO. 40 53 10.6 52.4 NO. 60 758 31.6 75.0 NO. 100 758 31.6 75.0 NO. 140 795 672 PAN 20.6 672 70TAL 500 100.0	NO. 4				1
NO.40 1.3 10.6 52.6 NO.60 75.8 31.6 75.6 NO.140 7 9.8 67.2 PAN 20.6 4/2 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.74 70.	NO. 10		1, 8		
NO.60  NO.100	NO. 20	2.5	5.0		1
NO.100 158 31,6 17.0  NO.140  NO.200 79 9 010  PAN 2016 4/2 2  TOTAL 500 1000	NO.40	5.3	10.6		52.6
NO.140  NO.200	NO.60				
NO.2∞     + a     9.5     L/2       PAN     ±0.6     4.12        TOTAL     50.0     100.0	N0.1∞	15.8	31,6		1-1.0
PAN 20.6 4/2  TOTAL 560 1060	NO.140	/			
TOTAL 500 1050	NO.200	4 4	9.8		412
	PAN	\$0.6	4/2		
	TOTAL	50.0	100.0		
REMARKS	REMARKS _				



3-2

#### HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M. D422-63.

			۲۱.۵.۱.		422-6	<u> </u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i>	R + 1= (Cm Cd)	DIA- METER (m m).		K	(%)	N ₁ (%)
		1/2	29	_	29.4	.059	11.4	بدان.	58.8	
		1	265		26.9	.042	11.8	4	53.8	
		γ	245	/	24.9	w 30	12,1	4	49.8	
		3	23	28	13,4	1025	12,4	′,	46.8	
		14	195	_	19.9	1012	13.0	4	39.8	
		51	15.5	28	15.9	10061	13.6	4	31.6	
		138	12.5	28	1~.9	.0040	14.1	"	25.8	
	०१००	265	11,0	17	11.0	10029	14.3	.0126	22.0	
	0730	655	9.5	24.5	8.5	10019	14,6	.0130	17.0	
	1930	1375	5.5	28	5.9	10013	15,2	.0124	11.8	
						<u> </u>				
										<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

3-2

FILE NO:_______
SAMPLE NO:______
DATE:_____
BY:_____

SIEVE	UEIGHT	PERCENT	CUMULATIA	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100-
NO. 10	1.3	2,6		
NO. 20	2.1	4,2		93.2
NO.40	3.0	6.0		57.2
NO.60				
NO.100	73	14.6		72.6
NO.140	/			
NO.200	4,-	f, 4		642
PAN	32.1	642		U
TOTAL	170,0	100.0		
REMARKS				

1604-1 FILE NO: SAMPLE NO: RB3-3 GRAIN SIZE CHART (70-180 DATE: COARSE 0001 CLAY FINE MEDIUM 001 SAND 1 TIE COARSE 0.03 -GRAIN SIZE (MM)-FINE Nº60 | Nº1 **MEDIUM** SAND SIZES - SIEVE COARSE 1.0 N. 10 PINE. GRAVEL **HEDICIBL** DE SCRIPTION: K FINER BY WEIGHT 3-3 170-180

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

,			A.S.T.	m. D4	12276	31				
3 T A O	ACTUAL TIME	ELAPSE TIME (MIN)	R _H		RH= CmCd			K	N (%)	Z-(%)
		1/2	8.0	_	1067	8.4	14.8	.0124	16.8	
		1	7.0	1	1048	7.4	15.0	"/	14.8	
		2	6.5	1	1034	6.9	15.1	1	13.8	
		3	6.0	28	1028	6.4	15,2	٠,	12.8	
		14	5.0		1013	5.4	15.3	"	10.8	
		40	3.5	u	,6077	3,9	15.5	4	7.8	
		126	2.0	28	10044	2.4	15.8	"	4, 8	
	6/00	250	72	27	150031	15	15.9	,0126	3,0	
	0730	640	1.5	24,5	10020	0.5	15.9	,0(30	1,0	
	1930	1360	1.0	28	10013		16.3	.0124		ļ
										ļ
								<u> </u>		

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
%<, N960 SIEVE:
% < Nº60 SIEVE:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

3-3 170-150

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.	<u> </u>			
3/8 IN.	<u> </u>		<u></u>	
NO. 4		 		100.0
NO. 10	1.1	2.2		97.8
NO. 20	6.1	12.2		85.6
NO.40	5.5	17.0		68.6
NO.60				
NO.100	21.1	42.2		26.4
NO.140				
NO.200	2.5	5.0		21.4
PAN	10.7	21.4		0
TOTAL	JC.U	100.0		
REMARKS				

FILE NO: SAMPLE NO: GRAIN SIZE CHART DATE: BY: 0001 CLAY FINE 0.005 MEDIUM 001 SILT GRAVEL COARSE 0.05 Nº500 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE MED IUM SAND - SIEVE SIZES COARSE GRAVEL **MEDICA** 

## 4-1

FILE NO:	
SAMPLE NO:	_
DATE:	
BY:	

A.S.T.M.	D	42	2-	6	3.
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			ــــــــــــــــــــــــــــــــــــــ	111.	422-6	· · · · · · · · · · · · · · · · · · ·				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	⊤επ <i>Ρ</i> . ℃	RH= RH+ (Corcd)	lmeteri		K	N (%)	(%)
		1/~	4.0		4.9	0.068	15.5	.०१४३	9.8	
			3.5		4.4	0.049	15.6	۰,	8.8	
		2	2.5		3.4	0034	15.7	*	6.8	
		3	2.2		3.1	0.028	15.1	"	6.2	
		14	2.0	29	2.9	0.013	"	"	5.8	
		50	0.5	_	1.4	0.0040	16.1	4	2.8	
		165	O	29	0.9	20039	16.4	4	1.8	
									ļ	
										ļ
									ļ	
						ļ				ļ
						<u> </u>				
							<u> </u>		ļ	ļ
						<u> </u>	<u> </u>		<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED = ; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE : N1 = (% < Nº60) N =N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

4-1

- SIEVE ANALYSIS -

FIL	.€ N≎:
SA.	TIPLE Nº:
DA	ΤΕ:
BY	/:

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.	_			
3/8 IN.				
NO. 4				
NO. 10				100.0
NO. 20	0.5	1.0		99
NO.40	15.4	30.8		68.2
NO.60				
NO.100	24.0	48.0		20.2
NO.140				
NO.200	3.1	6.2		14.6
PAN	7.0	14,0		0
TOTAL	50.0	1000	<u> </u>	<u> </u>
REMARKS				

FILE NO: RB 4-2 SAMPLE NO: GRAIN SIZE CHART 135-141 0001 COARSE CLAY FINE 0.005 MEDIUM 001 GPAVEL SAND COARSE 0.03 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE THE DIVIN SAND **S126S** - SIEVE COARSE GRAVEL MEDIUM 4. FINER BY WEIGHT

# 4-~ 135-141

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D422-63.
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			<u> </u>		1+22-C					
DATE	ACTUAL TIME	(MIN)	R _H	T£MP. ℃	R + ;= (Cor(d)	METER		K	N (%)	Z-(%)
		1/2	10		10.9	0.066	14.5	.0123	21.8	
			9		9,9	6047	14,7	"	19.8	
		2	7.5		8.4	2034	149	•	16.8	
		3	6.5		7.4	0.)7	14.9	7	14.8	
		14	5.0	29	5.9	0 013	15.3	',	11.8	<u></u>
		50	4,0		4.9	00068	15.5	•	9.8	
		160	3,0	29	3,9	01019	15.6	"	7.8	
		400	30	27	3,0	00023	,,	.0126	6.0	
		1365	2.0	28	2.4	204/3	15.8	.0124	4.8	
				ļ					ļ	
						<u> </u>				
										ļ
						ļ				
						<u> </u>				
						<u> </u>	<u> </u>		<u></u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

4-2 125-141

- SIEVE LIALYSIS -

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UE1611T	PERCENT	CUMULATIN	E PERCEINT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 114.				
1/2 IN.				
3/8 (N.				
NO. 4				100,0
140.10	57	11,4		88.6
NO.20	13.8	27.6		61.0
NO.40	7.4	14.8		46.2
NO.60				
N0.1∞	6.5	13,0		33,2
NO.140				
110.200	3.0	6.0		27.2
PAN	13.6	27.~		U
TOTAL	50.0	1000		
REMARKS				

FILE NO: SAMPLE NO: GRAIN SIZE CHART DAT€: BY: COABSE 0001 CLAY FINE 0.005 ПЕРІОП <u>a</u>01 SILT GPAVCL SAND COARSE Nº 200 Nº 200 Nº 200 Nº 60 | Nº 140 | -GRAIN SIZE (MM)-PINC 0.1 **MEDIUM** SAND - SIEVE SIZES COARSE FINE GRAVEL MEDIUM DESCRIPTION: KHUER BY IVEIGHT

# 4-3

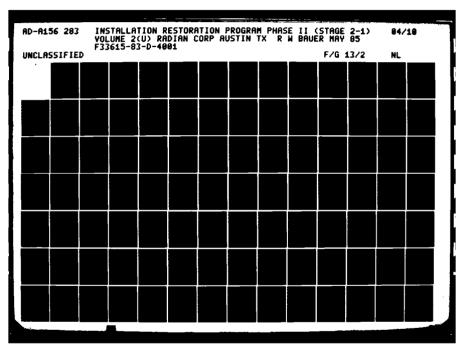
## HYDROMETER ANALYSIS

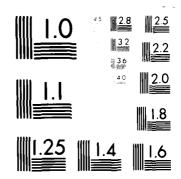
FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

A.S.T.M. D.422-63.

			۸.۵.۱.		21220					
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	R + ;= (Cor Cd)	METER		K	N (%)	N (%)
		1/2	11		11.0	0067	14.3	. مالا	22	
			10		10,0	0048	14.5	"	20	
		2	9		9,0	6034	14.3	'/	18	
		3	4.5		8.5	1.028	14.8	٠,	17	
		14	7	27	7.0	6.013	15.0	"	14	
		65	5.2	26	1	00067	15.7	, 0127	9.6	
		122	4.5	26	4.1	00040	15.4	1,	8,2	
		755	3.5	24	2,2	20019	15.5	.0130	4,4	
		1112	2.0	27	2.0	36615	15.6	.0126	4.0	
				· .						ļ
								ļ		
					<u>L</u>					<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
%< Nº60 SIEVE:
% < Nº60 SIEVE:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:





MICROCOPY RESOLUTION TEST CHART

1-3 155-160

- SIEVE ANALYSIS -

_	
	FILE NO:
-	SAMPLE Nº:
	DATE:
	BY:

SIEVE	<b>UEIGHT</b>	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2, IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	1.5	·.		
NO. 20	5.7			
NO.40	8.3			
NO.60				
NO.100	18.5	- 7		
NO.140				
NO.200	4.1			<u> </u>
PAN			<u> </u>	ļ
TOTAL			<u> </u>	

REMARKS____

FILE NO: SAMPLE NO: RB 4-4 GRAIN SIZE CHART 190-20 0001 COARSE CAY : #: ; FINE 0.005 MEDIUM 201 GRAVEL SILT COARSE 0.05 -GRAIN SIZE (MM);-FINE N960 | N910 **MEDIUM** SAND **S1265** - SIEVE COARSE N. 10 FINE GRAVEL MEDIUM DE SCRIPTION: COMMENTS K FINER BY WEIGHT

# 4-4

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D	42	2-	63.
----------	---	----	----	-----

, ASIIII, D422-65.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH= RH+ (CMCd)	DIA- METER (M M).	1	K	2(%)	N ₁ (%)
		1/2	5		5.0	0.070	(5.3	, olz	10.0	
		1	3,5		3.5	0.050	15,5	"	7.0	
		7	2.5		2.5	0,035	15.7	4	5.0	
		3	~		2,0	0029	15.8	"	4,0	
		14	2	27	20	0.013	15.8	•	4,0	
		60	115	4	1.1	0.0065	15.9	.423	2,2	
		150	1.0	26	0.6	0.0042	16.0	"	1.2	,
		750	1.5	24	6,2	0,0019	16.1	.0136	0.4	
		1110	٧,٧	27	0.2	00015	16.5	.0176	0.4	
									<u> </u>	
				<u> </u>					ļ	<u> </u>
									ļ	<u> </u>
									<u> </u>	<b></b>
								<u> </u>	<u> </u>	<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < NO SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{US}=R$
REMARKS:

4-4

- SIEVE ANALYSIS -

FILE NO:
SAMPLE NO:
DATE:
BY:

	<del></del>			
SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.				
1 IN.				
3/4 IN.				
1/2 IN.	<u> </u>			
3/8 IN.	<u> </u>			
NO. 4				
NO. 10	0			100.0
NO. 20	0.7	1.4		98.6
NO.40	5.4	10,4		87,1
NO.60		<del>-</del>		
NO.100	24.7	49.4		38.4
NO.140				
NO.200	12.4	24.8		13.6
PAN	6.8	13.6		υ
TOTAL	50.0	100.0		
REMARKS				

REMARKS

## 1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 90-100' 000 CLAY FINE MEDIUM 001 GRAVEL SAND COARSE 0.05 Nº100 Nº200 0.1 PINE THED IUM SAND SIEVE SIZES

MILT. CLASSIFICATION -GRAIN SIZE (MM)-

DE SCRIPTION:

N. 10

COARSE

FINE

MEDIUM

GRAVEL

K FINER BY WEIGHT

# RB 5-1 90 -100

Н	Y	DRO	me	TER	ANAL	YSIS
	•					

FILE NO:
SAMPLE NO:
DATE:
BY:

. 200			A.S.T.	m. D	422-6	3.				
3TAQ 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	℃	R 4 = R + (CrrCd)	DIA- METER (m m).		K	× (%)	N. (%)
		1/2	31		39.3	0.054	9.9	.0122	786	
		1	36		37.3	0 + 39	10.2	"/	74.6	
		~	34		35.3	0028	10.5	4	70.6	
		3	32,7		33.5	0.0 23	10.9	"	67.0	
		15	265	30	27.8	0011	11.7	,	17.6	
		40	21,5		22.8	0.0018	12.5	"	45.6	
		85	18	29	18.9	0.1648	13.2	.0123	378	
	0401	241	135	29	13.9	0.0027	13.8	, 0124	>7.8	
	0930	277	11,0	27	11.0	0.0029	14.3	عدان،	72.0	
	2030	1235	6.0	30	713	0.0014	15.2	·6/22	14.6	
				`						
					·					
									<u> </u>	

DESCRIPTION
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB 5-1

90-100

FILE NO:	
SAMPLE NO:	·
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	0			1000
NO. 20	2.7	1,4		376
NO.40	1.0	2.0		=66
NO.60				
NO.100	3.9	7.8		755
NO.140				
NO.200	3.0	6.0		(2)
PAN	41,4	52.8		0
TOTAL	500	1000		
REMARKS	<del></del>			

1604-1 FILE NO: RB 5-2 SAMPLE NO: GRAIN SIZE CHART 115'-170 0001 CLAY FINE 0.005 ПЕРІОП 001 GRAVEL BAND THE COARSE 0.05 Nº60 | Nº140 | MILT. CLASSIFICATION -- GRAIN SIZE (MM)-**MEDIUM** SAND SIZES COARSE MEDIUM DE SCRIPTION: K FINER BY WEIGHT

# RB5-V

FILE NO:	
FILE NO: SAMPLE NO:	_
DATE:	<u> </u>
BY:	_

.1235			A.S.T.	m. D	422-6	3.				·
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP.	RH= RH+ (Corcd)	DIA- METER (m m).		K	N (%)	Z (%)
		1/2	36		31.3	0.05K	9.9	, 0   22	78.6	
		1	34.5	. 4 <u>6</u>	37.8	0.039	10-1	t,	75.6	
		2	34		35.3	0.028	10.5	l	70.6	
		3	33		343	0.023	10.7	4	68.6	
		11	29	30	30.3	0112	11.4	4	60.6	
		44	23		24.3	0.0065	12.5	4	C8,6	
	0400	210	16	26	16.4	0.0032	13.5	10127	328	
	0901	240	175	2.7	13.5	0103	13.8	, 0126	27.0	
	2030	1200	7.0	30	10.3	0.0014	14.7	, 0122	20.6	
				`						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
%<, Nº60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{US}=R$
REMARKS:

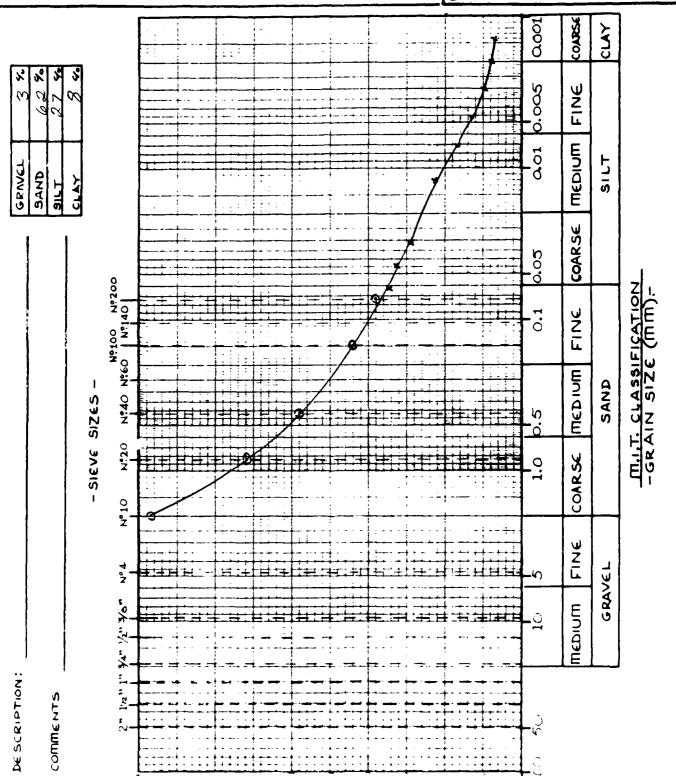
K3 = 2 115-120

FILE N9:	
FILE NO: SAMPLE NO: DATE:	
DATE:	
BV.	

-SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				<u> </u>
21/2 IN.				
2 IN.				
1 ½ IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/a IN.				
NO. 4				1030
NO. 10	0.2	0.4		34.6
NO. 20	0.9	1. <b>f</b>		978
NO.40	0.9	3.6		34,2
NO.60				
NO.100	4.3	8.6		856
NO.140				
NO.200	2.1	4, 7		814
PAN	40,7	181.4		
TOTAL	50.0	1000		
EMARKS	<del></del>	<u> </u>		

# GRAIN SIZE CHART FILE NO: 1604-1 SAMPLE NO: RB 5-3 DATE: 135'-146' BY:



W FINCE BY WEIGHT

# RB-5-3 135-140

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

الاعح			AST.	m. D	422-6	ح				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	Ru+ Corcd	DIA- METER (m m).		K	Z (%)	N ₁ (%)
		1/2	16		17.7	0.067	13.5	,0/22	34,6	
			15	,	16.3	0.045	13.7	4	32.6	
		ν	13		14.3	1.032	14.0	l,	28.6	
		3	12		13.3	0.027	14.2	ų	26,6	
		15	10	70	11.3	0.012	14.5	7	22,6	
		44	7	-	8.3	0.0071	15.0	4	16,6	
		106	V.5	29	6.4	0.0047	15.2	. 6123	12.8	
	0400	265	4.5	27	4.9	0,0030	12.3	,0124	9.8	
	0930	595	4,0	27	4.0	0.0020	15.5	,0126	8.0	
	2030	1255	2.0	30	3,3	0.0014	15.8	,0122	6.6	
			<b> </b>	,						

DESCRIPTION
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB5-3 135-140

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.			<u></u>	
NO. 4			<u></u>	1000
NO. 10	1.4	28		-32
NO. 20	12.6	25.2		72
NO.40	7./	14,2		17.8
NO.60		<del></del>		
NO.100	7.0	14,0		428
NO.140				
NO.200	3./	6.2		326
PAN	18.8	37.6	<u> </u>	)
TOTAL	50.0	1073		
REMARKS				<u> </u>

1604-1 FILE NO: RB 5-4 SAMPLE NO: GRAIN SIZE CHART 175-180 DATE : BY: 0001 COARSE CLAY FINE 0.005 MEDICH 001 GRAVEL SAND 31LT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-0.1 FINE MEDIUM SAND SIZES SIEVE COARSE N°10 FINE GRAVEL MEDICA COMMENTS

K FINER BY WEIGHT

RB5-4 175-180

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

.1130			AST.	m. D	422-E	.3 <i>.</i>				
DATE 19	ACTUAL TIME		RH	τεmΡ. ℃	RH= RH+ (Corcd)	METER		K	z%	N ₁ (%)
		1/~	31		32.3	0.057	11.7	حداه،	64,6	
		/	29	-	30,3	0041	11.4	4	60.3	
		~	77	-	28.3	0030	11.7	4	166	
		3	76	1	27.3	0.024	11.9	4	54,6	
		19	19.5	30	20.8	0010	12.9	4	41.6	
		41	15	1	14.3	00065	13.7	4	326	
		110	10	29	10.9	00045	14.5	.0123	21.8	
	0400	270	60	28	6.4	0.0029	15.2	.0124	12.8	
	093.	600	4,0	27	4.0	0.0020	12,5	.0126	8.0	
	2030	1260	1,0	30	2,3	0.0013	16.0	10122	4.6	
									ļ 	
	<u></u>			<u> </u>	<u></u> _					L

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

# RB5-4

Ì	FILE NO:
	SAMPLE NO:
	DATE:
	BY:

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	2.1	4.7		218
NO. 20	3.4	6.8		870
NO.40	2.4	4 9		:4~
NO.60				
NO.100	5.7	11,4		728
NO.140	/			
NO.200	3.8	76		65 x
PAN	226	65.2		
TOTAL	50	1000		

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 195'-100 DATE: BY: 0001 COARSE CLAY ::: FINE 0.005 000 MEDIUM GRAVEL SAND FILE COARSE 0.03 MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE Nº100 MEDIUM SAND - SIEVE SIZES COARSE N. 10 FINE GRAVEL TEDIOT DE SCRIPTION: COMMENTS K FINER BY WEIGHT

# RB5-5- K

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

. 013	5		AST.	m, D4	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	Ru+ Corcd	METER		K	N (%)	Z-(%)
		1/2	2.0.		2.0	0,071	4.8	,d26	40	
		1	1, •		1,0	0.050	16.0	4	710	
		V	110		/,0	0.036	16.0	"	20	
		3	0.5	27	0.5	0.029	16.0	"	1.0	
	0900	445	1,0	24.5	0	40025	16.0	.0130		
	2000	1225	0	28	6.4	0.0014	16.1	10124	0.8	
						`~				

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
N=R G × 100 =R  REMARKS: Whale Sauple 50 gm
REMARKS: Whale Sauple 50 gm

RB 5-5 195-200

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

-SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
<b>3</b> IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.			<u> </u>	
1 IN.				
3/4 IN.			<u> </u>	
1/2 IN.				
3/8 IN.				
NO. 4		 		100
NO. 10	2.7	1.4		98.3
NO. 20	7.4	14.8		35.2
NO.40	11.2/	22,4		61.4
NO.60				
NO.100	25.5	51.2		10,4
NO.140				
NO.200	<b>ごう</b>	4.6		5.3
PAN	2,9	5.7	<u> </u>	
TOTAL	50	100	<u> </u>	<u></u>
REMARKS				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 90'- 100 0001 COARSE CLAY FINE 0.005 MEDIUM 001 GRAVE COARSE 0.03 Nº100 Nº200 -GRAIN SIZE (MM)-FINE 0.1 **MEDIUM** SAND SIZES SIEVE COARSE FINE GRAVEL MEDIUM DE SCRIPTION: K FINCE BY WEIGHT

## RB-6-1 90-100

FILE NO:	
SAMPLE NO:	_
DATE:	_
BY:	

.1145			A.S.T.	m. D	422-6	S				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	<b>℃</b>	Ru+ Corcd	METER		K	Z (%)	Z-(%)
		1/4	30		31.3	0.058	11.2	re101	62.6	
		1	77.5		28.8	0.0K1	11.5	t,	57.6	
		4	35		26.3	0.030	120	7	526	
		3	24		25.3	6.025	12.2	4	50.6	
		7	21.0	70	22,3	0.016	12.7	"	44.6	
		36	15	_	16.3	10075	13.7	"	32.6	
		98	//. 0	24	11.9	0.0047	14.3	,0123	23.8	
	0400	255	7.0	24	7.4	40030	15:0	10124	14.6	
	0920	285	1.5	27	1.5	0.0029	15.2	60126	11,0	
	2036	1245	2.0	30	3.3	00014	15.8	עלוט.	6.6	
				,						

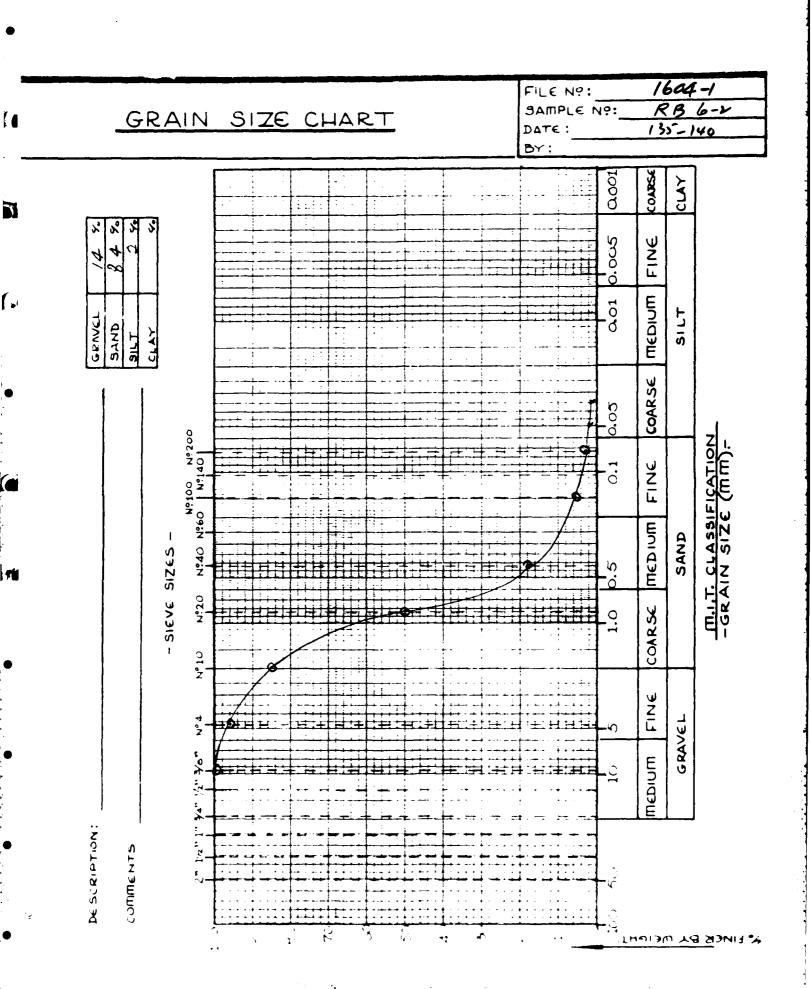
DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE:
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

RB 6-1

FILE NO:	
FILE NO:	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.		_		
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	O			1000
NO. 20	1.3	2		276
NO.40	1.0	2, <i>ù</i>		-7,76
NO.60				
NO.100	4.5	9.0		566
NO.140				
NO.200	3.9	28		200
PAN	304	288		)
TOTAL	50.0	1 00.0		
REMARKS				
_				



## RB-6-2 135-140

FILE NO:
SAMPLE NO:
DATE:
BY:

Sec.  -			A.S.T.	m. D	422-E	3.				<del></del>
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	RH	T€MP.		DIA- METER (m m),		K	N (%)	Z (%)
		11/2	1,7		1.6	0.073	16.0	.6/24	3,2	
		1	0,5	U	0.9	0.029	16.0	l _f	1.8	
		2	6,3	11	0.7	0,035	16.1	4	1.4	
		125	0	27	0	0.0045	16.1	10126		
	0530	305	0	26	1	0.5029	16.1	.0127		
							·			
				`						
				ļ.,						
DESCR	PTION	:								

SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
(1/ N°(0) SIEVE
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

135-140

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				<u></u>
3/4 IN.			<u>.</u>	<u> </u>
1/2 IN.				
3/8 IN.				100.0
NO. 4	13.4	<u> 39</u>		96,1
NO. 10	38.5	11.3		848
NO. 20	204 117.9	345		50.3
NO.40	19.3 111.6	32.7		17.6
NO.60				
NO.100	75 43.4	12.7		49
NO.140				
NO.200	09 T.V	1,5		34
PAN	1.9 110	34_	ļ	
TOTAL	340.9	1000	<u> </u>	
REMARKS_				
ĺ				

-# 10 = 289.0 gm Dry

facta = 5.78

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 170'-180' DATE: BY: 0001 COARSE CLAY 1.11 FINE MEDIUM 001 GPAVEL SAND 1116 COARSE 0.03 Nº200 -GRAIN SIZE (MM)-FINE 0016N Nº100 **MEDIUM** SAND S1265 - SIEVE COARSE N. 10 GRAVEL MEDIUM DE SCRIPTION: COMMENTS S FINER BY WEIGHT RB 6-3 170-180

LI	<b>Y</b> D	PA	m 6	TE	R.	A N I	A 1	V (	21	_
-	ט י	יאי	11116	. I C	K	$\Delta N$	$\Delta$	Y	<b>5</b> 1	=

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1230			AST.	m. D	422-E	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH= RH+ CMCd	DIA- METER (m m).		K	Z (%)	N. (%)
		1/2	9.0		10.3	0.066	14.7	, 0172	20.6	
		/	7,0	_	8,3	0.047	15.0	.,	16.6	
		V	415		6.8	0.034	15.2	"	13.6	
		3	5.0		63	0.028	15.3	4	12.6	
		15	4.0	30	5,3	1.012	12:2	"	10,6	
		43	7.5		3.8	0.0070	15.6	1,	7.6	
	0 400	215	1,~	28	1.6	0.0030	16.0	.0124	3.2	
	0900	245	1.2	27	1,2	0.0032	16.0	10126	2.K	
	2030	1205	1.0	30	2.3	1.0114	16.0	,0122	4.6	
<b> </b>					<b>}</b>					
				,				ļ		-
					<u> </u>					
					<u></u>					
DESCR	PHON	:								

SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < , Nº 60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

RB6-3 170-180

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.		_		
3/4 IN.			·	
1/2 IN.				
3/8 IN.		·		
NO. 4			ļ	
NO. 10	0			1000
NO. 20	1.2/	2.4		97 5
NO.40	4.8	96		ت غمر
NO.60				
NO.100	25.2/	504		37 5
NO.140				
NO.200	6.7	13. K		24 =
PAN	12.1	242	<u></u>	<u> </u>
TOTAL	50.0			<u> </u>

REMARKS_____

# GRAIN SIZE CHART

FILE NO: 1604-1

SAMPLE NO: RB 6-4

DATE: 190'- 200'

BY

BY:
CLAY
FINE O
AO1 SILT
COARSE
S I I I I I I I I I I I I I I I I I I I
RSC MEDIUM FINE SAND  M.I.T. CLASSIFICATION  GRAIN SIZE (MM);
COARSK GARSK A
L L L L L L L L L L L L L L L L L L L
TEDIUM CRAN
FHUER BY WEIGHT

## RB 6-4 190-202

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1300			A.S.T.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H		RH= RH+ (CMCd)	DIA- METER (m m).		K	N (%)	Z-(%)
		1/4	515	_	5.9	0.068	15.2	10/24	11.8	
		1	4.4	-	4.8	0.049	15.5	9	9.6	
		v	35	_	3.9	0.035	1.7	7	7.8	
		3	2,0	_	2,4	0.028	15.8	4	4,8	
		11	2,0	28	2.4	0.015	11.8	4	4.8	
		100	2.0	27	2.0	0.0050	15.8	.0126	4.0	
	0530	270	2.5	76	20	0.0030	15.6	10127	4.0	
	1+00	785	1,0	17	1,0	0.0018	16.0	10/26	2.0	
									ļ	
							Ĺ			
	<u> </u>				<u> </u>	<u> </u>				<u></u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº 60 SIEVE : N1 = (% < Nº 60) N =N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB 6-4 190-203

FILE NO:	
FILE NO: SAMPLE NO:_ DATE: BY:	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 1N.				
21/2 IN.				
2 IN.				<u> </u>
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.			<u></u>	
NO. 4				<u> </u>
NO. 10	0			150
NO. 20	1.4	2.4	<u> </u>	327
NO.40	1.4	9.6		196
NO.60			<u></u>	
NO.100	30.0	600		276
NO.140				
NO.200	₹.3	16.6		11.0
PAN	7.5	11.0		<u> </u>
TOTAL	50.0	1000		
REMARKS_				
_				

# GRAIN SIZE CHART

FILE NO: 1604.

SAMPLE NO: RA 7-2

135-140

	Q001	0.005	001	0.05	o O	0.5	0	· ÷·· · · · · · · · · · · · ·	<u> </u>	
) T .								±. H.H.	H 1212	
					- <del>9</del>			<u> </u>	1 <del>11</del> 14 1	
	-							- · · · · · · · · · · · · · · · · · · ·		
									<b>.</b>	
	-									
								13.4		
	· · ·	+						<u> </u>		
		:						/ } <b>3</b> :±1		
				0	Nº60   Nº140		N°10 N°20		*** '2" ***	: [
		Š	CLAY			S126.S -	- 51676			
		96%	SAND							SOMMENTS.
		4 %.	GRAVEL							DE SCRIPTION:

-GRAIN SIZE (MM)-

- THUER BY WEIGHT **

# RB7-V 135-140

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1,220			A.S.T.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	Ru+ CmCd	DIA- METER (m m).		K	Z (%)	N ₁ (%)
		1/2	5	·	5.4	0.069	15.3	10/24	10.8	
		1	4		4,4	1.049	72.5	11	8.8	
		V	7.5		3.9	0.035	15.5	4	7.8	
		3	3,0	28	3.4	0.028	15.6	1,	6.8	
		13	3,0	4	3,4	0.014	15.6	4	6.8	
		42	1.5	7	1.9	0.0076	15.8	,	3.8	
		130	1.0	77	1,0	0.00 CK	16.0	10126	2.0	
<u></u>	0530	310	1,0	26	0.6	0.0029	16.0	10127	1.2	
				<u> </u>						
				ļ						
				ļ						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \frac{1}{Us}$
REMARKS:

7-2 135-140

FILE NO:	
SAMPLE NO:	<u>_</u>
DΔΤΕ:	
BY:	

-SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u> </u>	ļ
1/2 IN.			<u> </u>	
3/8 IN.		<u> </u>		
NO. 4				1000
NO. 10	1.8	3.6		96.6
NO. 20	7.2	10,0		150
NO.40	18.0	36,0		46
NO.60				<u> </u>
NO.100	13.8	27,6		184
NO.140				
NO.200	2.9	5.8		12:5
PAN	6.3	12,8		
TOTAL	50,0	1500		
REMARKS				

1604 -1 FILE NO: SAMPLE NO:_ GRAIN SIZE CHART DATE: BY: 0001 COARSE CLAY FINE 0.005 MEDIUM 000 SAND COARSE 0.03 MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE FINE GRAVEL MEDICA S FINER BY WEIGHT RB 7-3 155-160

FILE NO:
SAMPLE NO:
DATE:
BY:

1/20	υ		AST.	m. D	422-E	·3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	τ <i>ε</i> mΡ. ℃	RH= RH+ (CMCd)	METER		K	N (%)	N, (%)
		1/2	3.0		3.0	1070	15.6	.0/26	4.0	5.2
		1	2.0		2.0	.050	15.8	4	4.0	3,4
		2	1.5		1,5	.036	15.9	1,	30	2.5
		5	1.0	27	1.0	102V	14.0	1,	2.0	1.7
		10	1.0	_	1.0	1016	16.0	11	2.0	1.7
	0300	180	0	26			16.3	,0127		
	0800	480	1.0	24						
									1	

DESCRIPTION.
SPECIFIC GRAVITY; G:ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
$N_1 = \frac{(\% < N^{\circ}60)}{100} N = \frac{850}{100} N \text{ (combined analysis)}.$
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

代13 7 3 155-160

- SIEVE ANALYSIS -

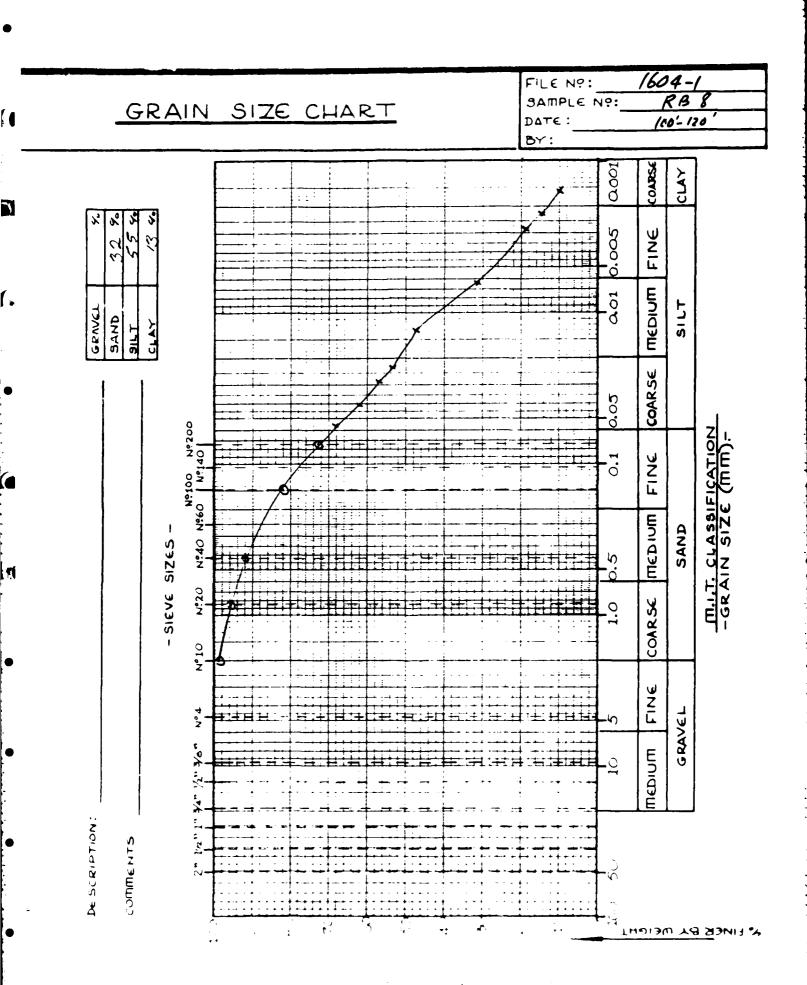
FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIVE PERCENT		
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING	
3 IN.					
21/2 IN.					
2 IN.					
1 1/2 IN.					
1 IN.					
3/4 IN.			,		
1/2 IN.					
3/8 IN.				1600	
NO. 4	-3. 3	۲, c		1	
NO. 10	12.0	7.1		l iii	
NO. 20	12.1 400	21.5		6-4,4	
NO.40	19.2 55.0	29,5		34.7	
NO.60					
NO.100	166 460	21,4		13.5	
NO.140					
NO.200	"1 75	13		\$ 2	
PAN	13 15.3	5.2-		(	
TOTAL	20 (2)	704			
REMARKS _	116.3				

- 710 160

3

-/sta 16: = 32



## RB8 100-120

FILE NO:	_
SAMPLE NO:	_
DATE:	_
BY:	

. (220)			A.S.T.	m. D	422-6	3 <i>.</i>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	Ru+ (Corcd)	DIA- METER (m m).		K	2%	N, (%)
		1/1	33	•	33.9	0.057	10.7	.0123	6 7.8	
		1	30		30.9	0.041	11.2	4	618	
		v	27.5		28.4	0.029	11.5	4	56.8	
		3	24	29	26.9	0.024	11.9	4	53.8	
		11.	225		23.4	0.013	12.4	4	46.8	
	1310	50	15.0	28	1514	0.0065	13.7	10/24	30.8	
		290	10.0	re	9.6	0.0028	14.5	,0127	19.Z	
	0800	460	8.0	K	7.6 -	0.0023	14.8	"	15,2	
		250	V.0	>7	5.0	0.0016	15.3	,0126	100	
				,						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB-8 100-120

$\ $	FILE NO:
-11	SAMPLE NO:
	DATE:
ш	BY:

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
<b>3</b> IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u> </u>	
1/2 IN.				
3/2 IN.				
NO. 4		<u> </u>		166,-
NO. 10	c.7	1.4		j , , ,
NO. 20	1.5	3. )		3.7.3
NO.40	1.8	3.6		92. 1
NO.60			<u> </u>	
NO.100	5.1	10.2		211
NO.140				
NO.200	4.5	90		72.2
PAN	364	72.8	<u> </u>	<del></del>
TOTAL	500	1 ( ) 0	<u> </u>	<u> </u>
REMARKS				

1604-1 RB8 FILE NO: SAMPLE NO: GRAIN SIZE CHART 135-140 COATESE 0001 CLAY FINE 0.005 MEDIUM 001 GRAVEL SAND 118 1 : : : COARSE 0.03 Nº500 Nº200 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND 51265 COARSE FINE GRAVEL TEDIOM K HINER BY WEIGHT

# RB 8 135-140

HYDROMETER	ANALYSIS
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FILE NO:
SAMPLE NO:
DATE:
BY:

1225			A.S.T.	m. D	422-6	.3.				
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).		K	2%)	N ₁ (%)
		1/4	35	r.	359	0.05-6	10.4	10/23	71.8	
		1	335	- 4	34.4	0.040	10.5	۲,	68.8	
		7	3/5		32.4	0.029	10.9	4	64.8	
		3	30	29	30.9	0.024	11.2	7	61.8	
		7	285	_	29.4	0.016	11.4	l+	18.8	
	1710	45	20	26	20,4	0.0066	12.9	, 0124	401	
		285	7.0	26	6.4	0.0029	15.0	. 0127	13.2	
	0800	45	45	26	4.1	0.0023	15.3	, ,	8,2	
		945	1,0	77	1,0	0.0016	16.0	10126	2.0	
					<u> </u>					

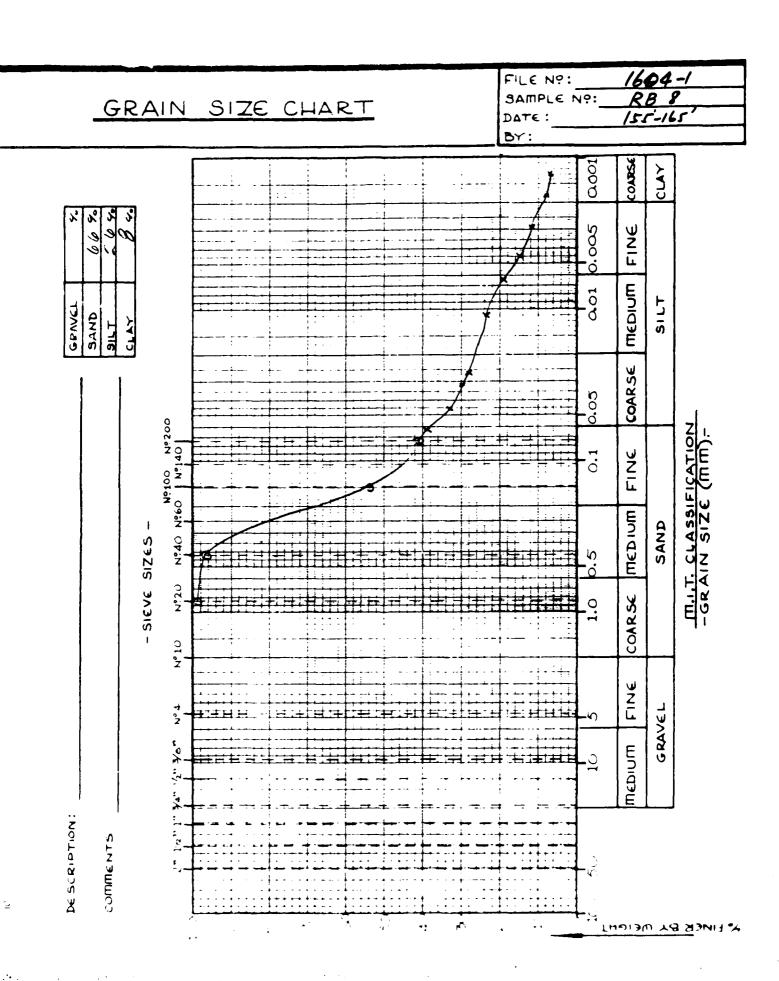
DESCRIPTION:	
SPECIFIC GRAVITY; G: ASSUMED =	;CALCULATED =
MENISCUS CORRECTION, Cm:	
DISPERSING AGENT CORRECTION, Cd:	
DRY WEIGHT OF SOIL, Us:	•
% < Nº60 SIEVE:	
% < Nº60 SIEVE :N (COMBINED	ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \frac{1}{100}$	
REMARKS:	

RB-8 135-140

FILE NO:______
SAMPLE NO:_____
DATE:____
BY:____

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				130.0
NO. 10	0.4	0.8		99,2
NO.20	ار ي	JV		950
NO.40	2:1	UV		901
NO.60				
NO.100	4.1	ς.~		8 2.6
NO.140				
NO.200	3.3	66		76
PAN	38.0	260		J.
TOTAL	500	15,0		
REMARKS				



## RB-8 155-165

FILE NO:	
ISAMPLE NO:	
DATE:	
BY:	

1245			AST.	m. D	422-6	.3 <i>.</i>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃		DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/~	19		19.4	0.063	13.0	,0124	38.8	
		1	16	_	16.4	0,016	13.5	4	328	
		~	14.5	-	14.9	0.032	13.7	1,	29.8	
		3	13.5	>8	13.9	0.027	13.8	1,	27.8	
		19	11.5	_	11.9	0.011	14.2	4	23.8	
	<u></u>	574	9,0	24	9.4	0.00 65	14.7	4	18.8	
		110	7.5	17	7.5	00045	14.8	,0126	N.0	
	0530	285	6.5	4	6.1	0.0029	15.0	.0127	12.2	
	1400	800	4,0	27	4.0	8.0018	11.5	1016	8.0	
		1260	3,5	27	3.5	0.00/3	155	l,	7:0	
				`						
<u> </u>			 							
			<u> </u>							
					<u> </u>					

DESCRIPTION.
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL , Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R - \frac{1}{Us}$
REMARKS:

RB - 8 155 - 16 =

FILE NO:
SAMPLE Nº:
DATE:
BY:

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	2			1000
NO. 20	<b>5.</b> 5	1.0		9.4
NO.40	1.2/	2.4		9 ~ 5
NO.60				
NO.100	21.5	43.0		5? 5
NO.140				
NO.200	6.4	12 8		حم. د 4
PAN	20.4	40 8		
TOTAL	50.0	100		

REMARKS

# 1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 170 - 220 DATE: 0001 CLAY FINE **MEDIUM** 000 GRAVEL 31LT COARSE -GRAIN SIZE (MM)-FINE THED IUM SAND - SIEVE SIZES COARSE GRAVEL MEDICA W FINER BY WEIGHT

### RB-8 170-220

FILE NO:
SAMPLE NO:
DATE:
BY:

0130			AST.	m. D	422-6	.3 ₀				
3TAD	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	RH= RH+ (CMCd)	DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	4	-	6	0.069	4.2	,0126	12	
			5		5	0.049	45.3	11	10	
		✓	45		4.5	0.035	15.3	1,	9.0	
		3	4.0	77	4,0	0.029	4.5	1,	8.0	
	stegu		_~_	7,	7,0			.0130		
	0900	450	25	24.5	1.4	0.0024	15.6	16130	2.8	
	2200	1230	0	28	0.4	0014	16.1	10/24	08	
			ļ							
									<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL Us:
% < ,Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

170 - 220

11

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

- SIEVE ANALYSIS -

	<del></del>			Market Control
SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100
NO. 10	6.8	13.6		86.4
NO. 20	14.6	29.2		57.2
NO.40	13.0	26.5		31.2
NO.60			! 	
NO.100	7.1	14.2		17
NO.140				
NO.200	1.6	3.2		13.7
PAN	5.9	13.8		
TOTAL	50	100		
REMARKS				

604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 100-103 0000 COARSE CLAY FINE MEDIUM 001 GRAVEL SAND SILT COARSE 0.05 Nº500 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE FINE GRAVEL TEDIUM DE SCRIPTION: K FINER BY WEIGHT

1

RB-9 100-103

FILE NO:
SAMPLE NO:
DATE:
BY:

1215			A.S.T.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	R 4,= Ru+ (Corcd)	DIA- METER (m m).		K	Z (%)	N, (%)
		1/2	17		18.3	0.063	13.3	,0/22	36.6	
		/	16	1	17.3	0.045	13.5	<i>(</i> ,	34.6	
		7	15		16,3	s.032		4	32.6	
		1	14	30	1513	0.020	13.8	4	30.6	
		"/	13		14.3	1.014	14.0	4	28.6	
	12:34	24	11		1213	0.0194	14.3	7	74.6	
	1:34	84	9	_	10.3	0.005/	14.7	4	206	
	0750	455	7	7	6.1	0.0022	15.0	,0129	12,4	
		1440	4	>7	4	0.0013	15.5	.0126	8	
							7.			
<b>]</b>										

DCQCRIT TRATE
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, La:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R - \frac{100}{Us}$
REMARKS:

RB-9 106-103

FILE NO:	
FILE NO:	
DATE:	
DATE:	

- SIEVE ANALYSIS -

7

1.1

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.			<u> </u>	
1 1/2 IN.			·	
1 IN.				<u> </u>
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	0.4	0.6		SAZ
NO. 20	1.0	20		ニュチレ
NO.40	0.9	18		954
NO.60				
NO.100	5.3	10.6		84.8
NO.140				
NO.200	3.3	6.6		78.7
PAN	39,1	78.2		<u></u>
TOTAL	50.0	1000		<u> </u>
EMARKS				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 16r'-200 DATE : 0000 COARSE CLAY FINE 0.005 **MEDIUM** 001 SILT CPAVEL SAND SILT COARSE 0.03 -GRAIN SIZE (MM)-0.1 PINC Nº100 THED IUM SAND - SIEVE SIZES COARSE N°10 PINA GRAVEL MEDICA K FINCE BY WEIGHT KHY

RB-9 165-200

FILE NO: SAMPLE NO: DATE: BY:

0125	A.S.T. M.	D422-63.

DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	R + = (Cor Cd)	DIA- METER (M/M).		K	2%)	N_ (%)
		1/2	16	_	16	0.065	13.5	,6/76	32	
		1	15.2	_	15,2	0.047	13.7	"	30,4	
		ν	14	1	14,0	.033	13.8	4	28.0	
		3	13,3	27	13.3	1027	14,0	4	26.6	
		19	10.5	"	10,5	,010	14,3	4	21.0	
		47	8.5	4	8,5	10070	14.7	4	17.0	
	0400	155	6.0	l,	6.0	.6039	15.2	y	12.0	
	0900	455	50	24.5	4,1.	,0024	15.3	.0130	8.2	
	2200	1235	1.5	28	1.9	10014	15.8	.044	3.8	
					,					
					L		· · · · · · · · · · · · · · · · · · ·		ļ <u>.</u>	
					İ 					

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE:
$N = R \frac{G}{G-1} \times \frac{100}{US} = R $
REMARKS:

RB - 9 165 - 200

FILE NO:	
SAMPLE Nº:_	
DATE:	
BY:	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1500
NO. 10	₹३	4.6		75.4
NO. 20	6.2	12.4		43
NO.40	7.3	14.6		68.4
NO.60				
N0.1∞	13.7	27.4		41
NO.140				
NO.200	2,4	48		262
PAN	18,1	36.2		
TOTAL	50.u	1500		
REMARKS _				

# GRAIN SIZE CHART

FILE NO: 1604-1 SAMPLE NO: RB 9 DATE: 120-127

BY

	BY:
	CLAY COLAY
C 4 6 C C C C C C C C C C C C C C C C C	S. O.
GRNVCL SAND SILT CLAY	A SILT
	COARSE
	SAND CLASSIFICATION N SIZE (MIM):
SiZ£S -	
- SIEVE S	COARSK THE LATER THE THE THE THE THE THE THE THE THE THE
	ν ₂
	S BEACH THE THE THE THE THE THE THE THE THE TH
DE SCRIPTION:	
7€ 5€	S FINCE BY WEIGHT

## RB-9 120-17

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

./250			A.S.T.	m. D	422-E	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	<b>℃</b>	RH+ CmCd	DIA- METER (m m).		K	N (%)	(%)
		1/2	22		23.3	0.061	12.5	<b>دد</b> ا ن	46.6	
		/	20		21.3	1.144	12.9	4	42.6	
		γ	18	20	19,3	0.03/	13.2	4	38.6	
		1	15	_	16.3	0.020	13.7	4	32.6	
		13	17		13.3	0.013	14.2	4	26.6	
		24	10	30	11.3	0.0091	14.5	"	22.6	
		60	7.5	/	8.8	0.0061	14.8	11	17.6	
	0750	420	1.5	25	4.6	0.0024	15.2	.0129	9.2	
		1440	3.0	4	3.0	00013	15.6	1012	6,0	
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				` .						
									ļ	
			<u></u>	<u> </u>	<u></u>		<u> </u>	<u> </u>	<u>L</u>	

DESCRIPTION.
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB-9 120-127

FILE NO:______
SAMPLE NO:_____
DATE:____
BY:____

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.			,	
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1606
NO. 10	4,9	9.8		900
NO. 20	6.1	122		75.0
NO.40	6.0	12 0		66,6
NO.60				
NO.100	4.1	8.2		57.2
NO.140				
NO.200	2.9	T \$		520
PAN	26.5	T2.0		
TOTAL	500	1600		

REMARKS_____

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART DATE: 0001 CLAY 0.005 FINE **MEDIUM** 001 CPAVCL BAND COARSE Nº100 Nº200 -GRAIN SIZE (MM)-FINE THED IUTH SAND SIZES COARSE MEDIUM K FINER BY WEIGHT

# RB-9 140-160

FILE NO:
SAMPLE NO:
DATE:
BY:

.1140		·	AST.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH= RH+ (CMCd)	DIA- METER (m m).		K	N (%)	Z-(%)
		1/~	12		4.8	0.0.87	15,7	、いけて	13,6	
		1	35		4.8	0.048	15,5	ι,	9,6	
		7	3, 8		4,3	0.034	15.6	٠,	8.6	
		3	7,5		3.8	0,028	15.7	ι,	7.6	
		11	2.0	30	3.3	0.05	15.8	٠,	4.6	
		40	0	-	1.3	0.0078	16.3	1,	2.6	
		107	-1	29	0			,0123		
	Ofor	260	-1	28	0			,0124		
	0930	290	-1	27	0			.6126		
	2030	1250	- 215	30	-1			, טוזע		
							<b></b>			
										ļ
										ļ
								<u></u>	<u> </u>	

MENISCUS CORRECTION, $Cm:$ DISPERSING AGENT CORRECTION, $Cd:$ DRY WEIGHT OF SOIL, $Us:$ % < Nº60 SIEVE: $N_1 = \binom{\% < N^060}{100} N = N \text{ (COMBINED ANALYSIS)}.$ $N = R \frac{G}{G-1} \times \frac{100}{Us} = R$	DESCRIPTION:
DISPERSING AGENT CORRECTION, Cd:  DRY WEIGHT OF SOIL, $U_3$ : $N_1 = \left(\frac{\% < N^960}{100}\right)N = N$ N (COMBINED ANALYSIS). $N = R \frac{G}{G-1} \times \frac{100}{U_5} = R$	SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
DRY WEIGHT OF SOIL, $U_9$ : % < Nº60 SIEVE: $N_1 = \left(\frac{\% < N°60}{100}\right)N = N \text{ (combined analysis)}.$ $N = R \frac{G}{G-1} \times \frac{100}{U_5} = R$	MENISCUS CORRECTION, Cm:
% < Nº60 SIEVE:	DISPERSING AGENT CORRECTION, Cd:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$	DRY WEIGHT OF SOIL . Us:
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$	% < Nº60 SIEVE :
	$N_1 = \frac{(\% < N\%60)}{100} N = N (COMBINED ANALYSIS).$
REMARKS:	$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
	REMARKS:

RB-9 140-160

- SIEVE ANALYSIS -

FILE NO:	_
SAMPLE NO:	
DATE:	_
BY:	_

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u> </u>	
1/2 IN.				
3/8 IN.				
NO. 4				150
NO. 10	1.7	34		966
NO. 20	11.7	23.4		922
NO.40	10.8	216		v-16
NO.60				
NO.100	14.7	29.4		222
NO.140				
NO.200	3.2	64		158
PAN	79	15.8		<u> </u>
TOTAL	500	1000		<u> </u>
REMARKS _				

1604-1 FILE NO: RB 10-1 75-80 SAMPLE NO: GRAIN SIZE CHART DATE : BY: 0001 CLAY ::: FINE 0.005 MEDIUM 001 GPAVEL SAND 91LT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-0.1 FINE **MEDIUM** SAND **S1265** - SIEVE COARSE N°10 GRAVEL TIEDIUM DE SURIPTION: K FINER BY WEIGHT RB-10-1 75-80

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1250			A.S.T.	m. D	422-E	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> m <i>P</i> . ℃	RH= RH+ (Corcd)	METER		K	N (%)	2%
		1/2	38		38.4	0055	9.9	16/24	76,8	
		1	35		75,4	0.040	10.4	11	70.8	
		~	31	_	31,4	0029	11.1	4	62.8	
		3	285	28	289	0.024	11.4	4	57.8	
		19	20		20,4	0010	12.9	4	40,8	
		50	13,5	21	13.9	0.0065	13.8	11	27.8	
		106	10	7	100	0.0047	14.5	. 0126	20.0	
	0530	280	7.5	26	7.1	0.0029	14.8	,0127	14.2	
	1400	795	4.0	27	4.0	0,0018	15.5	.014	8.0	
		1560.	3. U	27	3,0	00013	15.6	"	6.0	
				,					<u> </u>	
										}

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL , Us:
% < ,Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

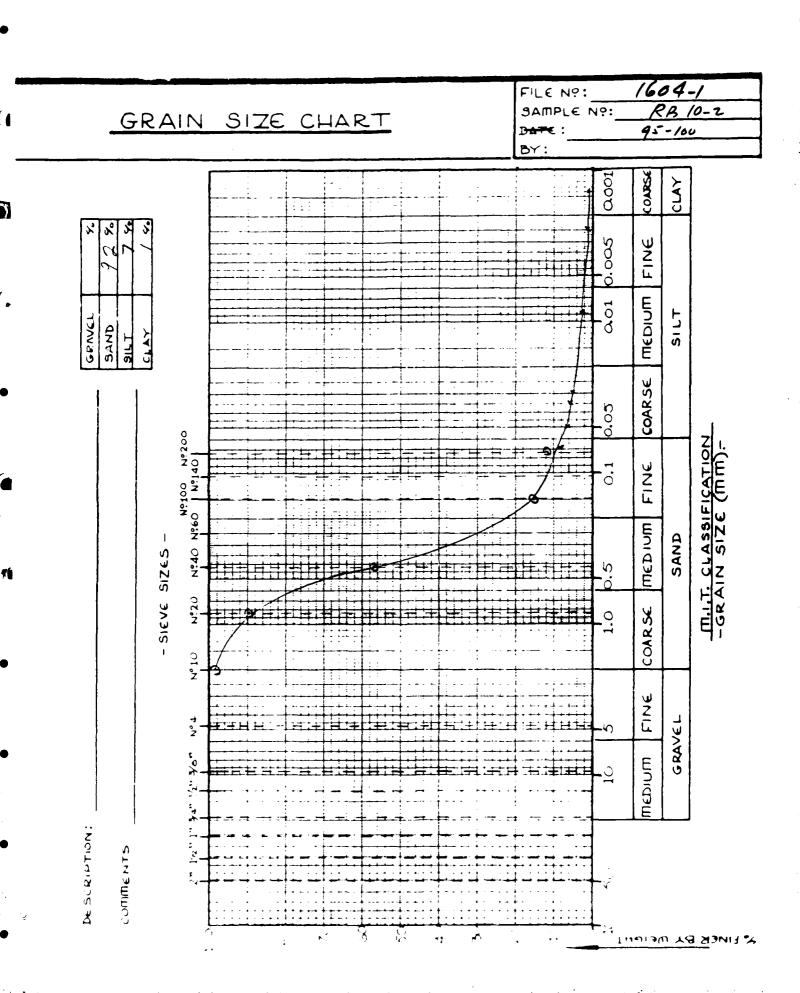
RB 110-1

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

- SIEVE ANALYSIS -

1.1

SIEVE	<b>UEIGHT</b>	PERCENT		VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				183,5
NO. 10	1.2	2.4		27.5
NO. 20	2.4	47		928
NO.40	1.3	26		7.2
NO.60				
N0.100	7,9	5.8		34.4
NO.140				
NO.200	2.5	5-0		ಗತ ⊈
PAN	39 7	119.4		<u></u>
TOTAL	10.0	190 8		
REMARKS				



## RB10-2 95-100

FILE NO:
SAMPLE NO:
DATE:
BY:

0145			A.S.T.	m. D	422-6	3.				
9 TAQ 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R + ,= (Cm Cd)	DIA- METER (M M).		K	N (%)	N, (%)
		1/~	4. 0		4,0	0.070	15,5	. 0126	8.0	
		1	3.2		3,2	0.050	15.6	"/	6.4	
·		γ	3,0		3,0	0.035	15.6	/,	6,0	
	-	3	2.5	27	2.5	0.029	15.6	"	5.0	
		29	1.5	,,	1,5	0.0094	16,0	1,	3,0	
	1900	435	1.5	24.5	0.4	0.0025	16.0	10130	0.5	
	2200	1215	0	28	0,4	0.0014	16.7	1014	0.8	
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				L						
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<u> </u>				<u> </u>					<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
%<, N960 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{IOO}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

RB 10-6

95 - 100

FILE NO:______
SAMPLE NO:_____
DATE:____
BY:____

SIEVE	UEIGHT	PERCENT	CUMULATI	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.			<u>                                     </u>	
3/4 IN.				<u> </u>
1/2 IN.				<u> </u>
3/8 IN.				
NO. 4				ں دے :
NO. 10	0.8	1.6		-15 4
NO.20	4.4	P. 3		576
NO.40	16.3	32,6		5-7
NO.60				
NO.100	20.9	1.3		15.~
NO.140				
NO.200	1.5	3.0		122
PAN	خا خا	1825		
TOTAL	3	100		<u></u>
REMARKS				

1604-1 FILE NO: RB 10-3 SAMPLE NO: GRAIN SIZE CHART 135'-140' DAT€: 000 COARSE CLAY FINE 0.005 MEDIUM 001 GRAVEL SAND COARSE Nº200 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE GRAVEL MEDIUM K FINER BY WEIGHT RB-10-3

FILE NO:
SAMPLE NO:
DATE:
BY:

,1235		·	A.S.T.	m. D	422-6	3.			· · · · · · · · · · · · · · · · · · ·	
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	R 4,= (Cor(d)	DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	31		31.4	0.058	11-1	.0124	62.8	
		1	30		30,4	0641	//. 2	le	60.8	
		2	27.5		27.9	0.030	11.5	l,	5.2.8	
		3	24.5	28	26.9	0.024	11.7	4	53.8	
		19	27	11	32,4	0.010	12.5	4	44.8	
		33	20	"	20,4	0.0078	12.9	1,	40.8	
		68	18	"	18.4	0.0055	13.2	4	36.8	
		117	16	27	16,0	0,0043	13.5	10126	32.0	
6	0530	795	14	76	13.6	a u o 27		.0127	27.2	
	1400	810	10	27	10.0	0.0017	14.5	10/26	20.0	
		26 hr	1.5	77	5.5	0.0012	15.2	lı .	11.0	
<b> </b>										
			L		<u> </u>					

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SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

R13-10-3 135-140

FILE NO:	
SAMPLE Nº:_	
DATE:	

SAMPLE Nº:
DATE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100,0
NO. 10	<b>5.6</b>	1. 2		37.2
NO. 20	3.0	6.5		92.4
NO.40	4.5	<u>;</u>		727
NO.60				
N0.1∞	70	14.0		70.2
NO.140				
NO.200	3.2	5 · 4		14 4
PAN	22.2	644		
TOTAL	50.0	1000		
REMARKS _				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 155-160 DATE: 0001 CLAY FINE 0.005 MEDIUM ao1 BAND COARSE Nº 100 Nº 250 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND **S126S** SIEVE COARSE GRAVEL TEDICE W HACK BY WEIGHT

### RB10-4 135-160

FILE NO:
SAMPLE NO:
DATE:
BY:

#### HYDROMETER ANALYSIS

1230 AST.M. D422-63. RH= DIA-TEMP. RH+ METER CMCd) (MM). ELAPSE R_H STAD ACTUAL TIME N₁ (%) N (%) TIME (MIN) 19 1/~ 1.5 3.8 1.9 15.8° 10/24 0.070 1.~ 1.6 0.050 16.0 3.2 1.0 28 2.8 1.4 16.0 0.035 27 120 ,0124 0.0046 16.1 6530 n 360 00029 0,8 1127 16.0

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < ,N960 SIEVE:
$N_1 = \frac{(\% < N^{\circ}60)}{100}N = N (COMBINED ANALYSIS).$
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

RB 10 - 4 155 - 160

FILE NO:	
FILE NO: SAMPLE NO:_ DATE: BY:	
DATE:	<del></del>
RY.	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1300
NO. 10	0.6	12		3-2
NO. 20	18.5	? 7. ≎		312
NO.40	17.3	34.6		29.2
NO.60	_			<u> </u>
NO.100	10.5	21.0		5 2
NO.140				
NO.200	0.6	1.2		<i>P</i> 3
PAN	5.5	1-0		<u></u>
TOTAL	500	(60,0		<u> </u>

# GRAIN SIZE CHART

FILE NO: 1604-1

SAMPLE NO: RB-11

DATE: 100-105'

BY:

·		BY:	
		Q001	CLAY
4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			FINE
GRNVCL SAND SILT CLAY		o contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction	MEDIUM SILT
		\$000	COARSE
Nº60 Nº100			SAND CLASSIFICATION N SIZE (MM)-
SiZES -		5,0	SAND CLASSI
- SIEVE 9		0.7	COARSE MEI
ž -	*:=H=:=:=:=:=:=:=:=:=:=:=:=:=:=:=:=:=:=:	7.±: +4.1±1±4±40	FINE
**************************************			medium GRA
COMMENTS  COMMENTS  TENTS  TEN		÷	
À EO			

.

FINER BY WEIGHT

13

# RB-11

100-105

FILE NO:

SAMPLE NO: SB-11

DATE: Aug 15.54

BY:

.11:50	)		AST.	m. D4	422-E	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH- CMCd	DIA- METER (m m).		K	N (%)	N- (%)
		1/2	16		17:3	0.003	13.5	,0/22	346	
		/	15		16.3	0.045	13.7	1/	22.6	
		γ	. 14	30°C	15.3	0032	13.8	4	30.6	
		5	12	/	13.3	0.021	14.2	7	26.6	
		13	11	~	12.3	20/3	14.5	1,	24.6	
	1224	34	8	30°C	9,3	0.0080	14.8	,	18.6	
	1:24	94	6	_	7,3	0.1049	15.2	",	14,6	
	0250	480	3.5	25	2.6	00023	15.5	,0129	5.2	
		1440	1,0	27	1,0	0.001)	16.0	.0126	2.0	
									ļ <u></u> -	
						ł			ł	_

DESCRIPTION:	•
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =;	•
MENISCUS CORRECTION, Cm:	•
DISPERSING AGENT CORRECTION, Cd:	•
DRY WEIGHT OF SOIL, Us:	
% < Nº60 SIEVE:	
% < Nº60 SIEVE : N1 = (% < Nº60) N =N (COMBINED ANALYSIS).	
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$	
REMARKS:	,

RB-11 100'-105 LH

FILE NO:	-
SAMPLE NO:_	
DATE:	<del></del>
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			,	
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	1.5	3.0		97
NO. 20	6.1	12.2		544
NO.40	10.5	21.0		138
NO.60				<u> </u>
NO.100	13.0	76.0		37.8
NO.140				
NO.200	1.7	3, 1		34.4
PAN	17.2	34.4		<u>ن</u>
TOTAL	50.0	1500		
REMARKS				
_				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 130'-135' 0001 CLAY FINE MEDIUM 001 SAND COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM); 0.1 PINE **MEDIUM** SAND - SIEVE SIZES -COARSE TEDIOM STINER BY WEIGHT RB-11 130-135

FILE NO:
SAMPLE NO:
DATE:
BY:

. 1210			A.S.T.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	R 4,= R 4 + (CmCd)	DIA- METER (m m).		K	N (%)	N, (%)
		1/~	9		10.3	0.066	14.7	.0(72	20.6	
		1	11		(0,3	0,046	14.3	۶.	20.6	
		ν	8		9.3	0.133	14.8	4	18.6	
		3	7		8,3	0.027	15.0	4	16.6	
		7	6.5	30	7.8	0.018	15.0	4	15.6	
		32	4.0	_	5.3	04085	127	"	10.6	
		77	3.0	29	3.9	0.0055	15.6	3دان.	7.8	
	64W	235	2.0	24	2.4	0.0032	15-8	, 0174	4.8	
	0900	265	15	27	1.5	0.03/	17:8	١٥١٧.	3,0	
	2030	1225	U	30	1.3	60014	16.1	.0122	2.6	
				•						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

RB-11

130-135

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

3 IN. 21/2 IN. 2 IN. 11/2 IN. 1 IN. 3/4 IN. 1/2 IN.	RETAINED, g.	RETAINED	RETAINED	PASSING
2½ IN. 2 IN. 1½ IN. 1 IN. 3/4 IN.				
2 IN. 1½ IN. 1 IN. 3/4 IN.				
1 ½ IN. 1 IN. 3/4 IN. 1/2 IN.				
1 IN. 3/4 IN. 1/2 IN.				
3/4 IN. 1/2 IN.				
1/2 IN.				I
3/a IN.				
NO. 4				150.6
NO. 10	4.3	8.6		914
NO. 20	11.4	22.8		586
NO.40	2.7	174		1-12
NO.60	/			
NO.100	11.0	22.0		29.2
NO.140				
NO.200	2.3	46		246
PAN	123	246		ن
TOTAL	500	1000		
REMARKS				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 159'-192' DATE: 0001 CLAY 1::: FINE MEDIUM Q01 SAND COARSE 0.03 FINE MILT CLASSIF **MEDIUM** SAND - SIEVE SIZES COARSE W FINER BY WEIGHT RB-11 159-192

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1215			AST.	m. D	422-6	3.				·
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	R 4,= (Cor(Cd)	DIA- METER (m m).		K	N (%)	N ₁ (%)
		//	7	_	7.9	0067	K	, 0/23	15.8	
		1	6		6.9	0.048	15.2	١,	13.1	
		V	VJ		64	0.034	15.2	4	12.8	
		3	5.0	29	5.9	0.028	153	4	11.8	
		15	4.5	_	5.4	0.012	15.3	"	10.8	
	1310	42	25	28	2.9	00066	15.6	10124	5.1	
		295	2.0	26	1.6	0.0029	15.8	.0127	3. 4	
	0800	465	1.0	26	0.6	0.0024	16.0	"	1. ~	
		955	1,0	27	/, 0	0.0016	16.0	,0/26	2.	
				<b></b>	<u> </u>			ļ	ļ	
				· .	ļ				ļ	ļ
				ļ	ļ					ļ
				<u> </u>	ļ		ļ	ļ	ļ	
					ļ	ļ		ļ	ļ	
				<u>L</u>	<u></u>			<u> </u>	<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; GS: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
%<, Nº 60 SIEVE:
% < Nº60 SIEVE: $N_1 = \frac{(\% < N^{\circ}60)}{100} N = N \text{ (COMBINED ANALYSIS)}.$
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

R3-11 150-192 (70) -SIEVE ANALYSIS-

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

			T	00000
SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1-50
NO. 10	6.7	12,4		860
NO. 20	12.3	246		62
NO.40	3.8	76		.2.4
NO.60				
NO.100	14.0	250		264
NO.140				
NO.200	2.8	5.6		:
PAN	10+	79 1		
TOTAL	500	1000		
REMARKS _				

1604-1 FILE NO: RB 12 90'-100' SAMPLE NO: GRAIN SIZE CHART DAT€: 0001 OARSE CLAY MEDIUM 0.01 GPAVEL SAND COARSE 0.03 Nº 100 Nº 200 Nº 60 | Nº 140 | -GRAIN SIZE (MM)-PINC MEDIUM SAND COARSE PINE MEDICA

KHUER BY WELLINT

D

(B/2 50-10

## HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

#### AST.M. D422-63.

, 14.			A.S.T.	m. D4	<del>122-6</del>	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	R + ,= R + + (Cm Cd)	METER		K	N (%)	N_ (%)
		1/.	21		2213	0.061	12.7	.0/22	44.6	
		i	13	/	20.3	0.044	13.0	4	40,6	
			. 5	2, (	13,3	0.033	14.2	l,	26.6	
		5		• (1				"		
		13	13	"	11.3	0.013	14.5	1,	22.6	
	17 5	25	2	i,	10.3	0.0094	14.7	1	20.6	
	1	85	-	• ,	7,3	40052	15.2	"	14,6	
		470		7.7	3.1	3.0023	15.5	10/29	6.2	
		1440	7	2.3.	2	0.44/3	15.8	,0126	4	
									ļ	
				,						
					<u> </u>					
				<u></u>						
								<u> </u>		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL. Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

R -12 90 - 100

FILE NO:____ SAMPLE NO:_____ DATE:_____ BY:____

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u> </u>	
1/2 IN.				
3/8 IN.				
NO. 4				1500
NO. 10	0.4	0 8		-92 L
NO. 20	1.2	24		968
NO.40	0.6	1,2		956
NO.60				
NO.100	14.4	288		668
NO.140	<u> </u>			
NO.200	2.5	192		4.36
PAN	24.8	496	<u> </u>	2
TOTAL	50.0	1000	<u> </u>	

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART DATE: COARSE 0001 CLAY FINE 0.005 MEDIUM 201 BAND COARSE 0.03 00 N°200 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND 51265 COARSE PINE GRAVEL Періп

% FINER BY WEIGHT

## RB-12 140-145

#### HYDROMETER ANALYSIS

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

1240

A.S.T.M. D422-63.

(240			A.S.T.	III. D4	422-6	<u></u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£MP. ℃	Ru+ Corcd	DIA- METER (m m).		K	Z (%)	N, (%)
		1/2	34		34.4	aast	10.5	,0/24	68.8	
			32	_	32.4	0.041	10.9	11	64.8	
		7	30	_	304	0.029	11.2	4	60.8	
		3	28.5	28	28.9	0.024	11.4	41	57.8	
		19	27		22,4	0.010	125	4	44.8	
		57	15	28	15,4	0.0060	13.7	*	30.8	
		113	12,5	77	125	0.00 KK	14.0	,0126	2170	
	0530	290	10,0	24	9.6	0.0028	14.5	.0127	19.2	
	1400	805	7.0	27	7.0	0.0021	15.0	.0126	14	
		76hrs	6.0	27	6.0	0.00/2	15.2	"	12	
							ļ			
							ļ			
					<u></u>	<u> </u>	<u> </u>		<u></u>	

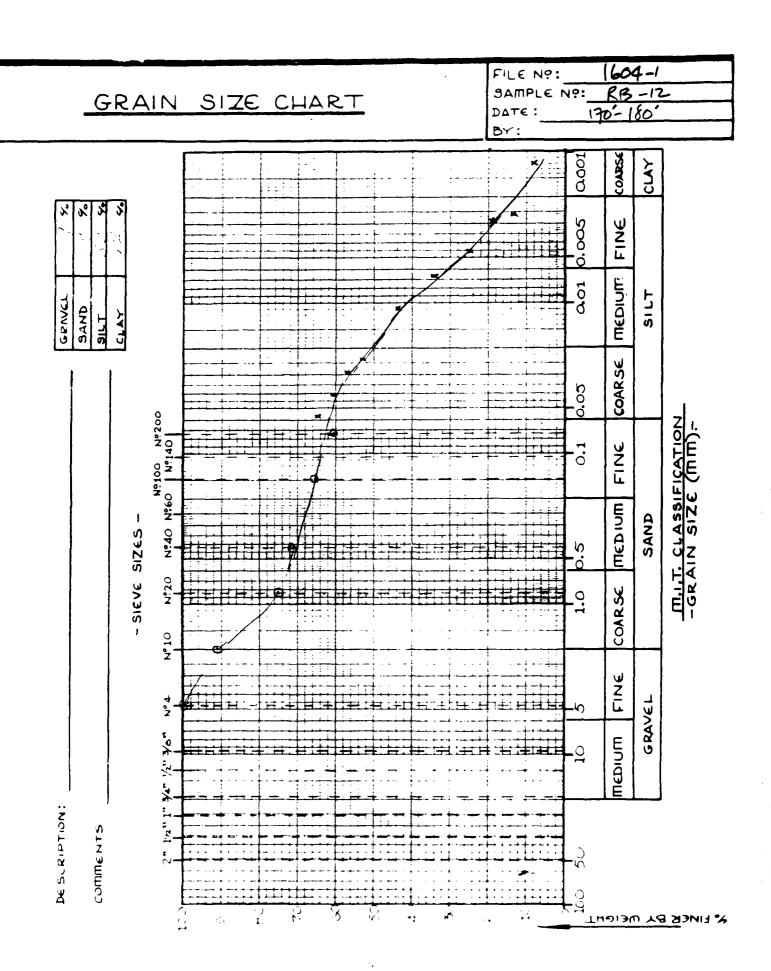
DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE:
$N=R \frac{G}{G-1} \times \frac{100}{Us} = R - \frac{100}{Us}$
REMARKS:

RB-12 140-145

FILE NO:	
FILE NO: SAMPLE NO: DATE:	
DATE:	

SAMPLE Nº:
DATE:
BY:
JULATIVE PERCENT

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	1.1	2.2		47 /
NO. 20	3.0	6.0		918
NO.40	2.0	4.0		200
NO.60				
NO.100	6.2	12.4		75 +
NO.140				
NO.200	2.3	4 b		73,2
PAN	2.3	7,2		
TOTAL	5-0.0	1 em 0		<u> </u>
REMARKS				



# RB-1~ 170-180

FILE NO:	٦
SAMPLE NO:	-
DATE:	-
BY:	

121	-		A.S.T.	m. D	422-E	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	RHJ= CMCd)	DIA- METER (m m).		K	N (%)	2-%
		1/4	32		32.4	.057	109	.0124	64.8	
		1	30		30.4	104/	11,2	L _f	608	
		ν	26		28.4	1029	11,5	4	8.62	
		3	24	28	26.4	, 424	11.9	11	52.8	
		15	21.8	",	22.2	-011	125	4	44.4	
		45	14.5	4	16.9	.0067	13.4	1,	33.8	
		103	12,5	29	12,5	,0046	13.9	10126	25.0	
	05 30	275	10.0	76	9.6	10029	14,5	(0127	19,2	
	1400	790	6.5	77	65	10017	15.1	.0126	13,6	
		26hr.	4.0	27	4.0	10012	15.5	10126	8	
<b> </b>										
<b> </b>										
DESCRI	PTION							_	<del></del>	

SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL La:
% < ,N960 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB-12 170-180

FILE NO:	
SAMPLE N?:_	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATI	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	7	8.6		91.4
NO. 20	$\mathbb{C}_{\mathcal{A}}$	16.0		75.4
NO.40	1.2	3, 6		71.8
NO.60				
N0.1∞		6.4		65.4
NO.140				
NO.200	2.7	5.4		600
PAN	30.0	60.0		0
TOTAL	50.0	100.0		
REMARKS				

1604-1 FILE NO: RB 12 180'-190' SAMPLE NO: GRAIN SIZE CHART DATE: 0001 COARSE CLAY 0.005 FINE MEDIUM 000 SILT BAND COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **Medium** SAND **S126S** SIEVE COARSE **№** 10 GRAVEL MEDIUM DE SURIPTION

& FINER BY WEIGHT

213 -12 180-190

FILE NO:
SAMPLE NO:
DATE:
BY:

.124	0		A.S.T.	m. D	422-6	3.		<del> </del>	- ·	
3TAD	ACTUAL TIME	ELAPSE TIME (MIN)	R _H			DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	27		28.3	0.059	11.7	,0/22	56.6	
		/	25		26,3	0.042	12.0	ч	52.6	
		ν	23	30	24,3	0.030	12.4	4	48.6	
		7	2/	_	72,3	0.019	12.7	6	44.6	
		13	18	_	19,3	40/2	13.2	4	28.6	
	1:0	26	16	7.	17.3	0.0088	13.5	4	34.6	
	2:00	86	12	30	13.3	0.0050	14.2	"	26.6	
	0710	430	9	28	8.1	8.002 K	14.7	,0129	16.2	
		1440	6	27	6	0 00/3	15.2	, 0127	12.0	
DESCRI	PTION	:								

SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =; MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

**尺B**-12

180 - 190

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				12.5
NO. 10	2.3	44		n =
NO. 20	1.7	3.4		<u> </u>
NO.40	2.3			107
NO.60				
N0.100	7.7	15 K		72.4
NO.140				
NO.200	4.6	9.2		
PAN	31.5	63.2		
TOTAL	50.0	100		
REMARKS _				

FILE NO: SAMPLE NO: RB 13-1 GRAIN SIZE CHART D∆T€: 95-100 COADESE 0001 CLAY 0.005 FINE **MEDIUM** 001 GRAVEL SAND COARSE 00 N°200 N°140 | -GRAIN SIZE (MM)-FINE Nº100 N°60 **MEDIUM** SAND SIEVE SIZES COARSE GRAVEL MEDICIE

K FINER BY WEIGHT

# 13-1 95-100

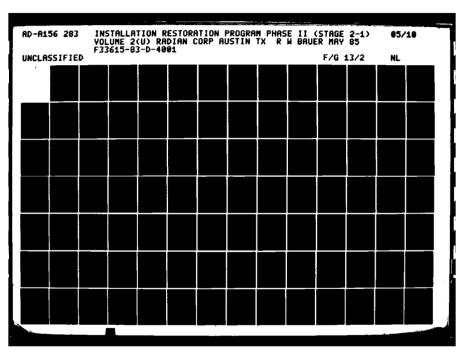
	Ξ
FILE NO:	
SAMPLE NO:	
DATE:	
BY:	_

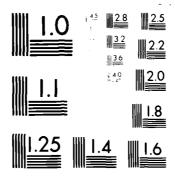
#### HYDROMETER ANALYSIS

ASTM. D422-63.

			A.S.T.	III. D	422-6	5.5.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	R + = R + + (Cor Cd)	DIA- METER (m m).		K	N (%)	N. (%)
		1/2	11		11,9	0.066	14.3	. 0123	23.8	
		1	10		18.9	0.047	14,5	1,	21.8	
		~	9		9,9	0.033	14.7	•	19.8	
		3	ç		4.9	0.627	14.4	',	17.8	
		14	6.0	29	6.9	0.013	15.4	^	13,8	
		46	3,5		4,4	10171	155	"	8.8	
		155	1.5	29	2.4	00060	16.0	•	4.8	
		395	1.5	19	1.5	0.6325	16.0	.0126	3,0	
	ļ	1356		26	1.4	00013	16.0	.0124	2.8	
										<u> </u>
					<u> </u>	ļ				
				ļ	ļ	<u> </u>				
		-	<b> </b>	-	ļ					ļ
				<u> </u>	<u> </u>		<u></u>	L	<u></u>	<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:





MICROCOPY RESOLUTION TEST CHART

NATIONAL BURGARCES CHARLES AND ABOVE A PERSONNEL PROPERTY.

13-1

FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100,0
NO. 10	3.9	85		91.5
NO. 20	13.3	29.0		62.5
NO.40	5.2	11,3		5/,~
NO.60				<u> </u>
NO.100	7.4	16.2		35.0
NO.140				
NO.200	2.2	4.8		30.2
PAN	13.8	30.2		U
TOTAL	45.8	100,0		1
REMARKS	Whole Sample T	otal ut = 45.8	<del>y</del> n	

FILE NO: RB 13-2 SAMPLE NO: GRAIN SIZE CHART 115-120 DATE: 0000 773 : - : FINE MEDIUM 000 GRAVEL BAND COARSE 0.03 Nº 200 -GRAIN SIZE (MM)-0.1 FINE THED IOM SAND - SIEVE SIZES COARSE FINE GRAVEL MEDIUM DE SCRIPTION: % FINER BY WEIGHT

# 13-2 115-120

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

### HYDROMETER ANALYSIS

#### AST.M. D422-63.

, <del></del>			Z\3.1.		422-6					
3TA0 	ACTUAL TIME	ELAPSE TIME (MIN)	RH	TEMP.	Ru+ Corcd	METER		K	N (%)	N, (%)
		1/2	24		rt	0.062	12.0	,0126	48	
		-	23		13	0.044	12.4	*	46	
		3	22		12	0.032	12.5	',	44	
		3	21		21	0.026	12.7	"	42	
		14	19.5	27	19.5	0.012	12.9	"	39.0	
		40	16		16.0	00073	13.5	1,	32	
		P >	13,5	27	13,5	0.6052	13.9	"	27.0	
		1 40	12.0	76	11.6	0.0036	14.4	.0127	23.2	
		-33%	11,0	27	11,0	01028	14.3	, 0126	22.0	
		780	9.0	24	7.7	0.0018	14.7	.0130	15.4	
		1140	7.0	27	7.0	6.0014	15.0	.0126	14,0	
		1360	6.5	36	6.1	0 0013	15.0	.017	12.1	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

13·2 115·120 an.3am.

FILE NO:	
SAMPLE NO:	·
DATE:	<del></del>
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				(50,0
NO. 10	1.8	2,13.9		99.9 96.1
NO. 20	4.7	10.1		87.8 86
NO.40	2.7	5.8		\$2.c 80. v
NO.60		-		
NO.100	74	16.0		66.0 64.2
NO.140				
NO.200	3.2	6,9		<b>A</b> 57.V
PAN	74.5	59.2		U
TOTAL	463	(00,0		
REMARKS _	whole sample			
	<del></del>			

FILE NO: SAMPLE NO: RB13-3 GRAIN SIZE CHART COARSE 0001 CLAY 147 FINE 0.005 **MEDIUM** 001 GRAVEL COARSE 0.03 N.200 -GRAIN SIZE (MM)-0.1 FING **MEDIUM** SAND SIEVE SIZES COARSE N. 10 GRAVEL THEDIUM DE SCRIPTION: % FINER BY WEIGHT

# 13-3

FILE NO	?:
SAMPL	E Nº:
DATE:	
BY:	

A.S.I.III. D444-65	A.S.T. M.	D422-63
--------------------	-----------	---------

	<del></del>		A.S.I.		422-6	<del> </del>				
3TA0 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	R 4 ;= Ru + (CorCd)	METER		K	N (%)	Z-(%)
		//•	37	2 %	37	0.05}	10.1	ماءر	74	
		1	35		35	0.04/	(0.4	1,	70	
		7	33		33	0.029	10.7	•,	66	
		3	32	,	3~	0.024	10.9	٠,	64	
		.14	245	27	29.5	0.011	11.~	٠	59	
		36	26	-	26	0.0072	11.9	4	52	
		80	32.5	27	725	0.0050	12,4	"	+3	
		45	19	26	18.6	0 0035	13.0	.017	37.0	
		300	16	27	16	0.0027	13,5	10176	3 V	
		775	13,5	24	12,2	00017	13.9	. 0130	24,4	
		1135	11.0	27	11,0	00014	143	.014	22.0	
		1355	10.0	36	9.6	0.00/3	145	.017	19,2	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

13-3 135'-145'

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				1
3/8 IN.				
NO. 4				
NO. 10	1.2	7.7-		
NO. 20	3.0			
NO.40	2.0			
NO.60				
NO.100	1.5			
NO.140				
NO.200	2.0	1.		
PAN				
TOTAL	\$0.6			
REMARKS				
_				

FILE NO: SAMPLE NO: RB 13-4 GRAIN SIZE CHART DAT€: BY: COARSE 0001 :::: FINE 0.005 MEDIUM 000 GRAVEL COARSE 0.05 -GRAIN SIZE (MM)-FINE Nº100 Nº60 | Nº1 **MEDIUM** SAND **S1265** SIEVE COARSE FINE GRAVEL MEDIUM DE SCRIPTION: S FINER BY WEIGHT

1

# 13-4

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

#### HYDROMETER ANALYSIS

AST.M. D422-63.

			AST.	····	422-6	· · · · · · · · · · · · · · · · · · ·				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP.		DIA- METER (m m).	1	K	N (%)	N, (%)
		1/4	4			0.071	15.5	,014	8.0	
			3		३०	0050	15.6	4	6.0	
		2	~		2.0	0.035	15.8	4	4,0	
		3	1.7	17	1.7	0.029	15.5	4	3,4	
		57	1.0	26	0,6	20067		1012	1,2	
		145	0.7	26	0.3	00042	16.1	"	0.6	
		745	1.5	24	0.2	0.0019	15.9	.0130	0.4	
		1105	0	>7	0	0.0015	163	10126	U	
				ļ						
				ļ		<b></b> _			ļ	
<b> </b>	<u> </u>			<u> </u>				ļ		
	<u></u>									
		<b></b>		ļ	ļ	-	ļ			<u> </u>
		ļ			<u> </u>		<del> </del>		<u> </u>	-
	L	<u> </u>	<u>                                     </u>	<u> </u>	<u></u>			<u> </u>	<u> </u>	<u> </u>

DESCRIPTION
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{US}=R$
REMARKS:

13-4

- SIEVE ANALYSIS -

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u></u>	
1/2 IN.				
3/8 IN.	<u> </u>			
NO. 4				
NO. 10	0	υ		100.0
NO. 20	/. 3	2.6		97.4
NO.40	7.5	15.0		82,4
NO.60				
NO.100	BD.27.2	54.4		28.0
NO.140				
NO.200	8.2	16.4		11,6
PAN	5.8	11.6		<u> </u>
TOTAL	50,0	100.0	<u> </u>	<u> </u>
REMARKS				

REMARKS _____

# FILE NO: RB 14-1 SAMPLE NO: GRAIN SIZE CHART 80-85 0001 CLAY FINE 0.005 MEDIUM 000 GRAVEL BAND SILT COARSE 0.03 -GRAIN SIZE (MM)-0.1 FINE Nº100 **MEDIUM** SAND SIZES - SIEVE COARSE N. 10 FINE GRAVEL TEDICE DE SCRIPTION: COMMENTS % FINER BY WEIGHT

# RB14-1 80-85

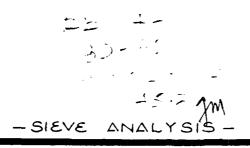
# HYDROMETER ANALYSIS

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

AST.M. D422-63.

<u>,</u>			A3.1.	111.	122-6	<u> </u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	τ <i>€</i> πΡ. ℃	RH;= CmCd)	DIA- METER (m m).		K	N (%)	2(%)
		1/4	20		20.3	0.163	12.9	10125	40.6	
		}	17		14.3	0.046	13.3	"	34.6	
		✓	14.5		14.8	0.033	13.7	"	29.6	
		3	13.0	27.6	13.3	0.027	14.0	<b>,</b>	26.6	
		14	10	1/	10.3	0013	14.5	4	20,6	
		50	7	11	4.3	0.0168	15.0	4	14.6	
		90	11	28	5.9	0.005/	15,7	1014	11.8	
		365	4.0	26	3.6	0.0026	15.5	, 0127	7. 2	
		1320	1.0	28	1.4	0,0014	16.0	1014	2,8	

JESCRIPHON:
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL. Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N =N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

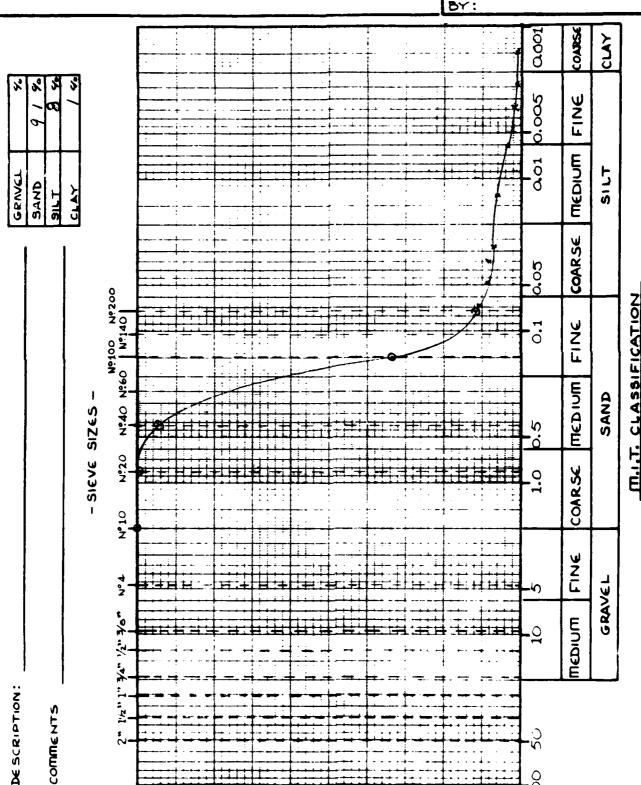


FILE NO:
SAMPLE NO:
DΔTE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			,	
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10		1.8		2.02
NO. 20		39_		943
NO.40	1,	3.7		925
NO.60		′		
NO.100	7.5	20.8		59,00
NO.140				
NO.200		20,1		497
PAN	22.7	49.7		<u> </u>
TOTAL	457	1000		
EMARKS				

# GRAIN SIZE CHART

FILE NO: SAMPLE NO: RB 14-2



-GRAIN SIZE (MM)-

K FINER BY WEIGHT

# RB14-2

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

A.S.T.M. D	422-63.
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-			AST.	111.	422-6	· <u>··</u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R 4,= R 4 + (CmCd)	METER		K	Z (%)	Z-(%)
		1/4	4		5.4	0.069	15.3	1044	10.8°	
		1 -	4		4.4	0.049	127	y	8.8	
		7	3.5		3,9	0.635	15.6	4	7.8	
		3	3	21	7.4	0,028	15.6	4	6.8	
		14	2.7	/	3.1	0013	15.6	4	6.2	
		65	115	21	1.9	20661	15.9	4	3.8	
		125	1,7	265	1.0	0.0034	160	.0127	2.0	
		415	1.5	25	0,6	0.6024	15.9	.0174	1,2	
		1125	0.5	17	0.5	40015	16.0	.0126	1.0	
				`						
							<u> </u>	<u> </u>	<u> </u>	<u> </u>

EB 12-1

_ : _ : >

	FILE NO:
ı	SAMPLE NO:
	DATE:
	BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	S			100,0
NO. 20	7.2	0		993
NO.40	ر د د	j		9-13
NO.60				
NO.100	20.5	610		37 6
NO.140				
NO.200	<i>X</i> , <i>'</i>	11 5		2/4
PAN	10.9	21 f		
TOTAL		1.00		
REMARKS				

FILE NO: RB 14-3 SAMPLE NO: GRAIN SIZE CHART BY: 0001 COARSE CLAY :: FINE 0.005 **MEDIUM** 001 GRAVEL BAND CLAY PILT COARSE 0.03 Nº500 Nº200 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND **S126S** - SIEVE COARSE N. 10 PINE GRAVEL MEDICA DE SCRIPTION: COMMENTS. % FINER BY WEIGHT

# RB14-3 180-200

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

AST.M. D422-63	AST.	т.	D	122	-6	3.
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			AST.	111. 0	422-6	, <u>, , , , , , , , , , , , , , , , , , </u>				
3TAD	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH= RH+ (CMCd)	METER		K	N (%)	Z, (%)
		1/2	9			0.067	14.7	10/24	19.8	
		1	P	·	8,4	4.48	14.1	4	17.8	
		ν	7		7.4	4034	15.0	4	15.8	
		3	6.5	28	6.9	0028	15.1	4	13.8	
		14	13	<u></u>	5.9	0.013	15.7	4	11.8	
		60	35	78	3.9	0.0063	15.5	"	7.8	
		220	3,0	245	2.8	Q0034	15.6	.0127	5.6	
		460	3,0	25	2.1	00024	15.6	10129	4.2	
		1/20	1.5	27	1.5	0,00,5	15.9	.0126	3, 3	
							,			
<b> </b>				`						
			ļ							
	ļ									

DESCRIPTION:
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB 14-3 180-200

FILE NO:	_
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1:00
NO. 10	/·/ :	3.2		7, 2
NO.20	-{	17.6		7∫ 3
NO.40	7.7	14.0		1- 5
NO.60				<u> </u>
NO.100	10.	21.6		43 )
NO.140				
NO.200	× , +	10.8		22 2
PAN	16.1	3.2.2		
TOTAL	, ,	/(1 %		
REMARKS_				
			·	

# GRAIN SIZE CHART

FILE NO: [604-1]

SAMPLE NO: RB (5-1)

DATE: [15'- 120']

BY:

	BY:	
	0001	CLAY
2 2 3 3 2 3 3 3	300	FINE
SAND SAND SILT CLAY	50	MEDIUM SILT
	500	COARSE
N9600 N9500	c c	SAND CLASSIFICATION N SIZE (MM)-
SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.5 - SiZ 6.	y o	SAND SAND CLASSI
S - Sieve	0	SA M.T. CL -GRAIN
2 2 2 2 3 2	다 # # # # # # W	TINE (C.L.
\$ = = = = = = = = = = = = = = = = = = =	# # # # D	MEDIUM GRA
COMMENTS  2" "1" "1" "1" "1" "1" "1" "1" "1" "1" "	2	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% FINER BY WEIGH

15-1

FILE NO:	
SAMPLE	۷ <u>٠</u> :
DATE:	
BY:	

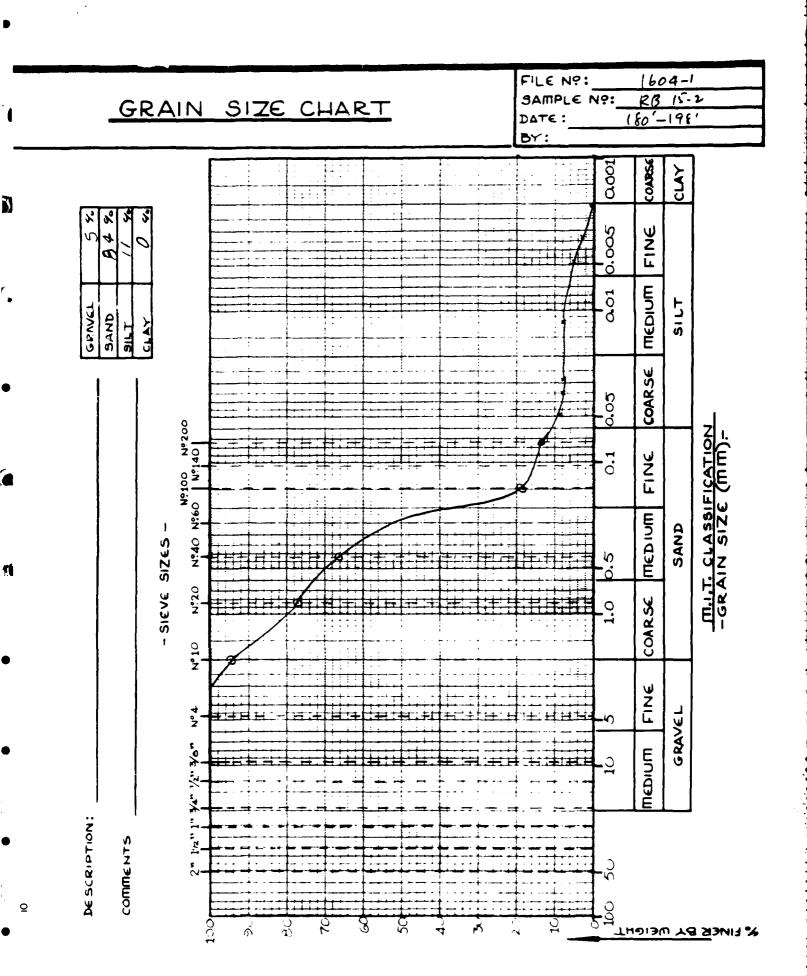
<u></u>	ASIM. D422-63									
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	τεπ <b>Ρ</b> . ℃	Ru+ Corce	DIA- METER (m m).		K	N (%)	Z-(%)
		1/2	5.5		,068	5.9	15.2	10124	//.8	
			1.0	-	.048	5.4	15.3	4	10.8	
		ν	4,0	_	1034	4,4	15.5	4	8.8	
		3	3.5	28	.628	3,9	15.6	4	7.8	
		14	3,0	_	LU13	3,4	15.6	"	6.8	
		110	1.5	28	.0047	1,9	15.9	"	3.8	
	0/50	230	0.7	27	10033	0.7	16.0	.0126	1.4	
	c730	620	1.2	24.7	1002	0,2	"	.0130	0.4	
	1930	1340	4.0	28	COULS		16.3	,0124		
				`						
					<u> </u>					
									<u> </u>	ļ
					<u> </u>		<u></u>		<u> </u>	<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED = ; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < N960 SIEVE:
% < Nº 60 SIEVE : N1 = (% < Nº 60) N = N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

15-1 115-120

FILE NO: SAMPLE NO:_ DATE: BY:	
SAMPLE Nº:_	<del></del>
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.				
NO. 4	-0-			1500
NO. 10	0.6	1,2		988
NO. 20	7.0	14,0		54.8
NO.40	13.8	27.6		57,2
NO.60				
NO.100	18.0	36.0		21.2
NO.140				
NO.200	3.0	6,0		15.2
PAN	2.6	15.2		<i>υ</i>
TOTAL	10.0	100.0		
REMARKS				



15-2 180-198

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

A.S.T.M. D	422-631
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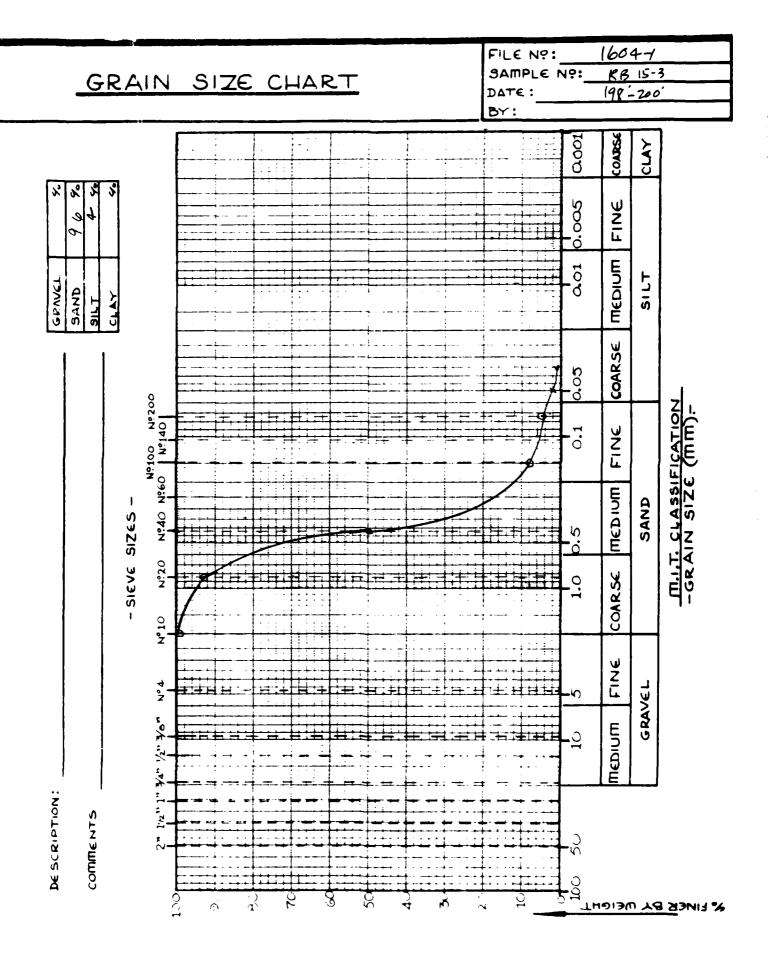
			<u> </u>		12270					
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	Ru+ Corce	METER	1	K	N (%)	Z-(%)
		1/2	5.0	-	1064	5.4	15.3	10124	10,8	
		1	4,0	1	1049	4,4	15.5	ч	8,8	
		2	3.5	/	1035	3,9	15.6	ነ	7.8	
		3	3,5	28	.028	3,9	15.6	7	7.8	
		17	3.5		1012	3,9	15.6	4	7.8	
		106	2.0	28	.0048	2,4	15.8	4	4.8	
	0100	225	1.5	27	.0033	1.5	15.9	.0126	3,0	
	0730	615	トン	24.7	,002/	O, V	16.0	· U(30	0,4	
	1930	1335	-1,0	28				.0124		
				`						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

15- 2 180-198

FILE NO:	
SAMPLE Nº:_	
DATE:	<del></del>
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4	_0 _			152.0
NO. 10	2.3	4.6		95.4
NO. 20	93	18.6		26.8
NO.40	75	15.0		65.8
NO.60				
N0.100	237	47.4		18.4
NO.140				
NO.200	2.3	4.6		138
PAN	6.9	13.8		0
TOTAL	50 U	100.0		
REMARKS_				



15-3

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M.	D422-63.
— ·~ · · · · · · · · · · · · · · · · · ·	U-FR- U-

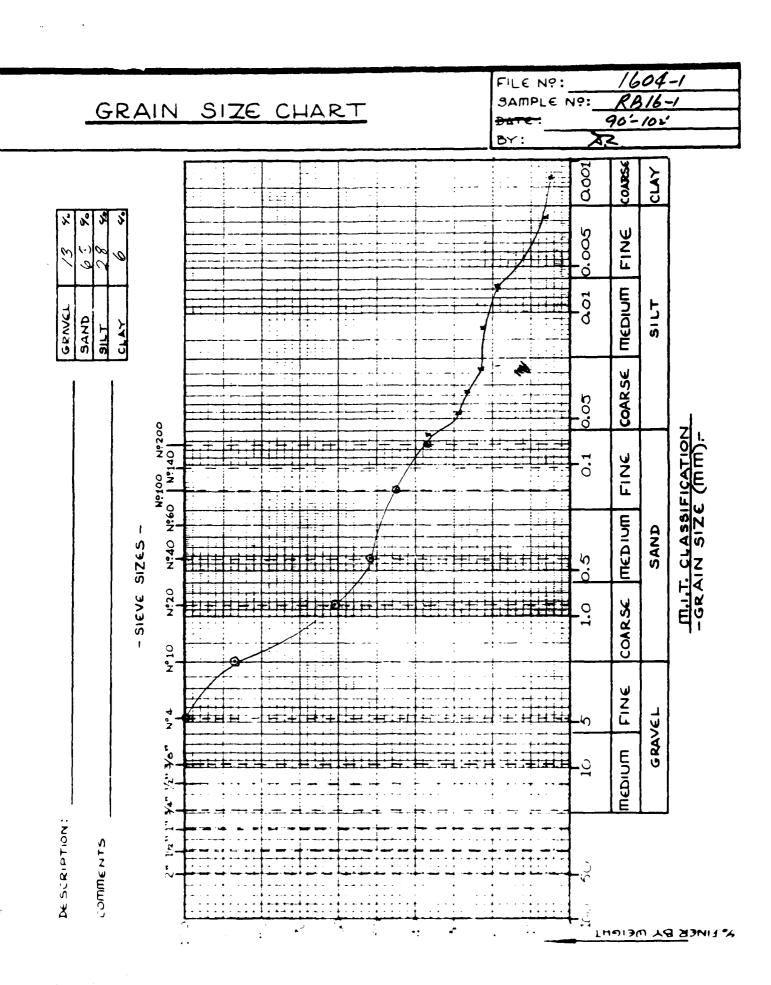
<del></del>			<u> </u>	111.	422-6	·				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	<b>℃</b>	RH= RH+ (CorCd)	METER		K	N (%)	N, (%)
		1/2.	1,6	_	1,4	.070	16.0	10/24	2.8	
			0,5	_	0,9	.050	16.1	4	1,6	
		2	0, 1	/	0.6	1035	16.1	4	1.2	
		3	6	28	0.4	1029	16.3	4	6.8	
		102	0	и	0.4	10049	4	4	0.1	
	0 00	220	0	27	O	16034	"	.0126	V	
	0730	610	1.6	24.7		1002	16.1	.0(36		
	1930	1330	-1,0	28				10129		
				,						

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL La:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

15-3 195-200

FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				1
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/z IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	<i>0.4</i>	0,8		99,2
NO. 20	3.0	6.0		93.2
NO.40	21,6	43,2		10.0
NO.60				
NO.100	20.8	41.6		8.4
NO.140				
NO.200	1.8	3.6		4.8
PAN	2,4	4, {		V
TOTAL	50.0	100.0		
REMARKS				
_				



# RB16-1 90-102

FILE NO:	_
SAMPLE NO:	_
DATE:	
BY:	

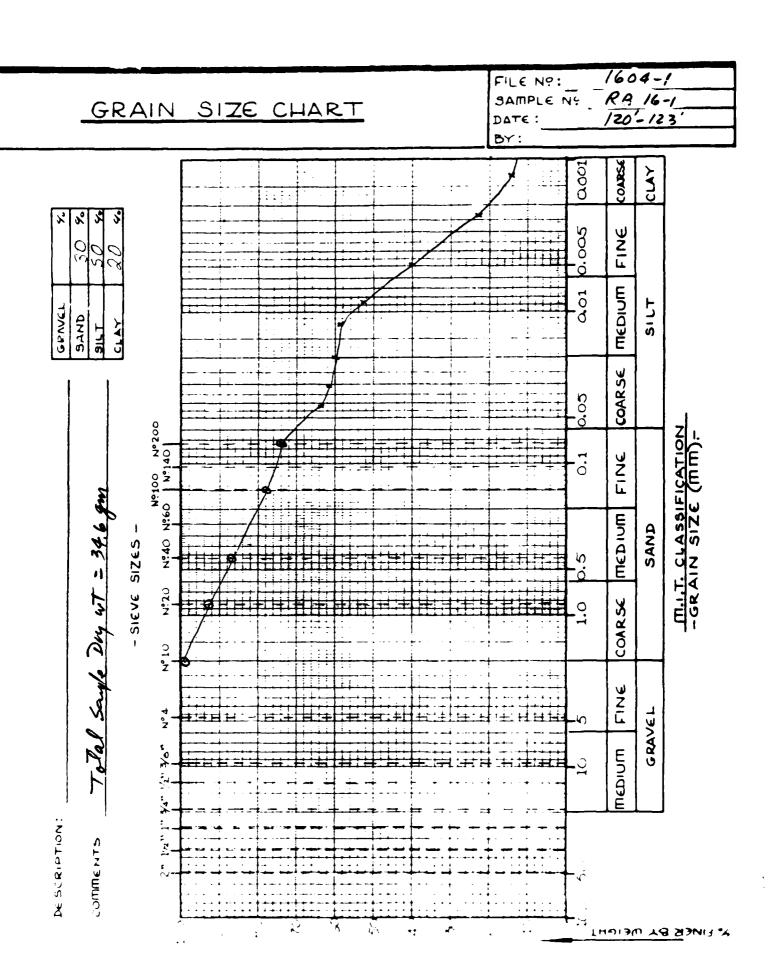
.1210			A.S.T.	m. D4	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	R + = (CmCd)	DIA- METER (m m).		K	Z (%)	Z-(%)
		1/2	17	_	18.3	0.063	13.3	、ひつひ	36.6	
		. /	13	-	14.3	0166	14.0	1,	28.6	
		γ	12	-	13.3	0.033	14.2	٠,	26.6	
		1		_				1.		
		/3	10	30	11.3	0013	14.5	"	22.6	
		27	8	/	9,3	0.0067	14.8	',	18.6	
		60	7		6,3	0.000	15.3	"	12.1	
	0750	460	4	25	3,1	0,0024	15.5	. 0/29	6.2	
		1440	2.5	27	2.5	0013	15.6	, 0126	50	
							<u></u>		ļ	
								ļ		
					ļ					
					<u> </u>		<u></u>		<u> </u>	<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

# 23 16- 4 90-102

FILE NO:	
SAMPLE NO:	
DATE:	· <del></del>

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	6.6	13.2		26 ?
NO. 20	12.2	25.6		5 2
NO.40	4.4	م کو شو		-)
NO.60		,		
NO.100	3.6	7, 2		1 25 2
NO.140				
NO.200	4.1	10.2		? 7. )
PAN	185	37.0		
TOTAL	500	1000		
REMARKS _	Whale son	the Tale, &	5 5 4	



# RA16-1 X 120-123

IYDROMETER ANALYSIS
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FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

										سنحت
,/230			A.S.T.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	Ru+ Corcd	METER		K	N (%)	N, (%)
		1/2		-	-		_	.0172		
		/	2/	-	22,3	0.043	12.7	4	64.4	
		2	20	_	2113	0.031	12.9	l,	615	
		7	19.5	30	20,8	0.420	12.9	4	60,1	
		13	19	_	20.3	0.012	13.0	7	547	
	1256	26	17	30	18.3	0.0087	13.3	4	54.9	
	1:17	86	12.5	30	13.8	0.0049	140	"/	40.0	
	0750	440	9	V	8.1	0.0024	14.7	.0129	23,4	
		1440	7	27	5	0.00/3	15.3	,0126	14,4	
				•						
	ļ									
<b>  </b>										
								<u> </u>		
11 1	1									

DCOCKIF IKM
SPECIFIC GRAVITY; G: ASSUMED = ; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd :
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{US}=R\frac{2.89}{US}$
REMARKS: Whole saysle Total 34.6 gm

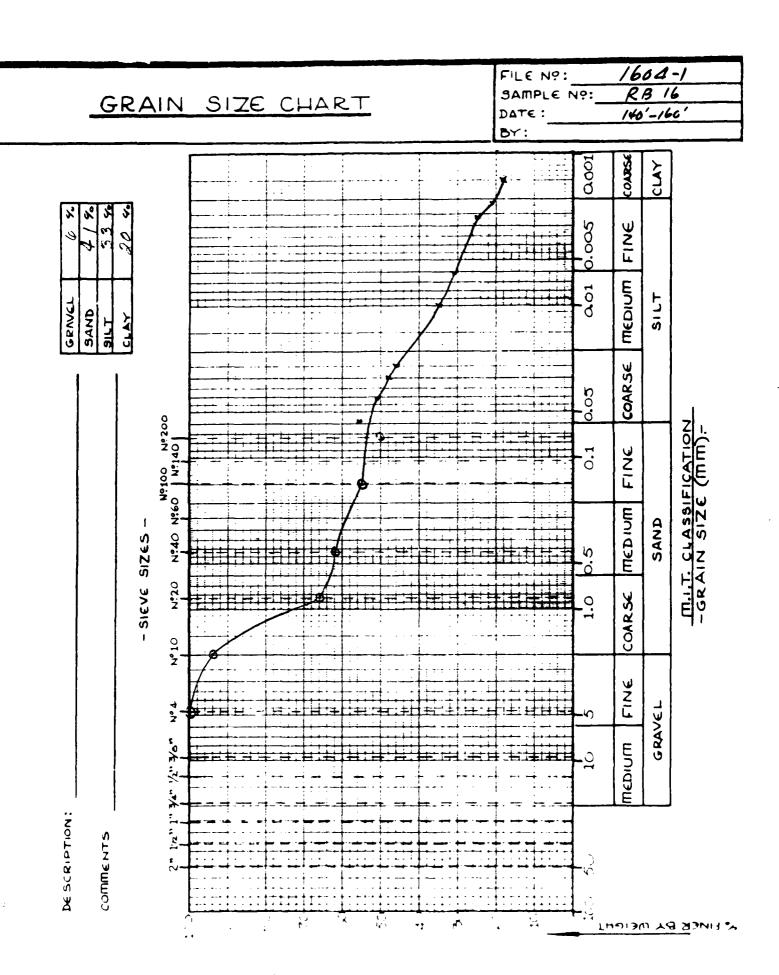
# RB 16 ₩ 120'- 123

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

- SIEVE ANALYSIS -

71

SIEVE	UEIGHT	PERCENT	CUMULATIVE PERCENT		
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING	
3 IN.					
21/2 IN.					
2 IN.					
1 1/2 IN.					
1 IN.					
3/4 IN.					
1/2 IN.					
3/8 IN.					
NO. 4				1000	
NO. 10	0.6	1.7		98.3	
NO. 20	1.8	ナン		931	
NO.40	2.0	5.6		\$73	
NO.60					
NO.100	3.1	89		784	
NO.140					
NO.200	1,4	4.0		74 +	
PAN	25.7	74.4		0	
TOTAL	346				
REMARKS _	Whole Sup	2 Total 3	4.65.		



## R13-16 140-160

FILE NO:
ISAMPLE Nº:
DATE:
BY:

,1210			AST.	m. D	422-6	<b>3</b> .				
DATE 19	ACTUAL TIME	(min)	R _H	T£mP. ℃	RH= RH+ (Corcd)	METER		K	2%	Z, (%)
		1/2	77		27.9	1059	11.7	.0123	17.8	
		1	8		25.9	1042	12,0	4	41.8	
		Y	23		23.9	,630	12,4	1,	47.8	
		3	22	29	22.9	1025	12.5	1	45.8	
		19	185	_	17.4	, 010	13.0	11	34.8	
	1310	60	15	28	15.4	10061	13.7	10/24	308	
	, ,	700	13	26	12.6	,0027	14,0	, 0/27	25,2	
	0800	470	//	26	10.6	10022	14.3	"	21.2	
		960	9	17	9.0	1095	14.7	,0/26	18.0	
				. ,						

DESCRIPTION
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº 60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB-16 140-160

FILE NO:	
CAMDI & NIO	- <del></del>
DATE:	
BY:	

- SIEVE ANALYSIS -

[1]

1.

SIEVE	UEIGHT	PERCENT	CUMULATI	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				<u> </u>
3/4 IN.				<del></del>
1/2 IN.				<del></del>
3/8 IN.				
NO. 4			<u> </u>	100.0
NO. 10	3.2	6.4		-136
NO.20	13.6	17.2		660
NO.40	2.2	4.4		62
NO.60				<del></del>
NO.100	3.3	6.6		,-5.4
NO.140				
NO.200	2.5	5.0		374
PAN	25.2	504	<u> </u>	0
TOTAL	500	100.0	<u> </u>	
REMARKS				
•				

1604-1 FILE NO: SAMPLE NO: GRAIN SIZE CHART 160-220 DATE: 0001 CLAY : ; ' FINE MEDIUM 0.01 GRAVEL SAND COARSE 0.05 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE FINE GRAVEL TEDIUM DE SCRIPTION: K FINER BY WEIGHT

(.

### RB-16 160-720

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

#### HYDROMETER ANALYSIS

0/20			AST.	m. D	422-6	3.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	Ru+ (Corcd)	DIA- METER (m m).		K	Z (%)	N- (%)
		1/4	16	/	16.4	0064	13.5	.6124	3218	
		1	14	/	14.4	0046	13.8	4	28.8	
		7	/~	26	12.4	0033	14,2	′,	14.8	
		3	11.5	27	11,5	4027	14.2	,0126	23.0	
		19	F.5	"	8,5	0.011	14.7	ι,	17,0	
		₹0	6.0	"	6.0	0.0069	15.2	4	12.0	
	0400	160	4.0	/,	4,0	0.0039	12.21	11	8.0	
	0900	460	3,0	24.5	2.1	0.00 24	15.6	10130	4.2	
	2200	1240	1.0	78	1.4	40014	16.0	,0124	2.8	
						<u> </u>				
<b> </b>										
									ļ	
				<u> </u>	<u></u>	<u> </u>			<u></u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1 = (% < Nº60) N =N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

RB - 16

	FILE NO:
l	SAMPLE NO:
l	DATE:
l	BY:

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.			_	
3/8 IN.				
NO. 4				100
NO. 10	0.3	ø.6		97,4
NO. 20	4.4	2.8		70.3
NO.40	2.3	4.6		86
NO.60				<u> </u>
NO.100	18.9	36.4		1.36
NO.140				
NO.200	6.9	12.4		37.2
PAN	18.6	37 2		
TOTAL	50	100		
REMARKS				
_				

FILE NO: SAMPLE NO: [B 17-1 GRAIN SIZE CHART 0001 COARSE CLAY 1::: FINE 0.005 MEDIUM 001 GUNVEL BAND COARSE 0.03 Nº100 Nº200 -GRAIN SIZE (MM)-FINE THED IUM SAND **S126S** - SIEVE COARSE GRAVEL MEDICA DE SURIPTION: COMMENTS % FINER BY WEIGHT

# RB 17-1 80-90

H,	Y	DF	50	Ш	ε	T	E	R	ANAL	YS	15	S
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FILE NO:
SAMPLE Nº:
DATE:
BY:

AST.M. D422-63

			A.S.I.		444-6	· <u>··</u>				
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).		K	, N (%)	Z, (%)
		1/2	16.5		14.0	0.063	13.4	10122	72	
		1	15		16.5	0.045	13.7	4	66	
		√	14		15,5	0.032	13.8	4	62	
		3	13	30.5	14.5	work	14,0	"	ú8	
		14	12		13.5	0.12	142	4	54	
		41	10	/	11.5	0.0073	14.5	1	146	
		215	8	295	9.1	0,0032	14.8	, 0(23	36.4	
		530	7	21.5	7.6	0.002	15.0	10174	30.4	
		1340	6	28	6.4	(1001)	15,7	10124	25,6	
				`						



FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
11/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	in.			
NO. 20				156 -
NO.40	0.2	0.8		93.5
NO.60				
NO.100	1.3	5.3		3= 1
NO.140		-		
NO.200	2.1	8.5		0 4
PAN	21.1	85.4		<u></u>
TOTAL	24 7	100,0		
REMARKS				
•		<del></del>		

FILE NO: SAMPLE NO: 尺月 17-3 GRAIN SIZE CHART 180-190 0001 COARSE CLAY 54% FINE 0.005 001 MEDIUM GRAVEL BAND 1118 COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE N. 10 FINE GRAVEL MEDIUM DE SCRIPTION: % FINER BY WEIGHT

# PB17-3 180-190

FILE NO.	
SAMPLE NO:	
DATE:	
BY:	

### HYDROMETER ANALYSIS

#### AST.M. D422-63.

, AQ.I.III. D422-65.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP. ℃	RHF RH+ (Corcd)	DIA- METER (m m).		K	N (%)	2~%
		1/2	4		72.5	0062	12.7	10122	45.0	
			185		20.0	0.044	13.1	1,	40,0	
		V	16.7		17.7	4032	135	4	35.4	
		3	15	30.5	145	0,026	13,7	"	33.0	
		14	13,3		14.8	0.012	14.0	4	29.6	
		37	9,7	/	10.7	0.1077	14.7	4	21.4	
		210	4.0	29,5	5.1	0,0033	15.5	.0123	10.2	
		525	1.5	285	2.1	1,0022	15.9	.0124	4,2	
		1335	1	28	1.4	0.0314	16.0	1,	2.8	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,Nº60 SIEVE :
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

KE 17-3

11

- SIEVE ANALYSIS -

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	_

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	<u></u>			150 0
NO. 20	2-1	0.2		22 .
NO.40		2		97. 7
NO.60				
NO.100		14.4		43 4
NO.140				
NO.200	، پ	26		77 8
PAN	25.4	70,8		<u> </u>
TOTAL	50.2	150 0		
REMARKS				

FILE NO: SAMPLE NO: RB 19-1 GRAIN SIZE CHART 0001 COARSE CLAY ::: FINE 0.005 001 MEDIUM GRAVEL SAND CL AY SILT COARSE 0.03 MILT. CLASSIFICATION -GRAIN SIZE (MM); FINE 0.1 Nº 10099N **MEDIUM** SAND SIZES - SIEVE COARSE N. 10 GRAVEL MEDIUM DE SCRIPTION: COMME NTS

% FINER BY WEIGHT

# RB 19-1 140-145

FILE NO:	
SAMPLE NO:	
DATE:	_
BY:	

HYDROMETER ANALYSIS

A ST M	D422-63	
	レキャんこりこ	

			AST.	m. D4	<u> 122-6</u>	<u>5.</u>				
3TA0 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R 4 = CmCd)	DIA- METER (m m).		K	X13,16 N (%)	N ₁ (%)
		1/2	-1		0.5			1012		
			11		0.5			11		
		v	"		0.5			/,		
		3	"	305	05			11		
		470	0	285	0.6			10124		
		1300	U	18	v.f			"		
					1	0-				
				1/	111			<del>                                     </del>	<u> </u>	
	<u> </u>			110	1 W			ļ	ļ	
<b></b>				0 -			ļ	ļ	ļ	ļ
<u> </u>	<b> </b>									
<b></b>		ļ			ļ			<u> </u>	<del> </del>	
<b> </b>	<b> </b>	<u> </u>		ļ		<del> </del>		ļ		ļ
H		<u> </u>			<u> </u>	<u> </u>	<u>L</u>	<u> </u>	<u> </u>	<u> </u>

RB 19-1 140-145 10.9:711 -SIEVE ANALYSIS-

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FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	3,5	72.3		J72
NO. 20	5.0	458		21,9
NO.40	5.0	64		155
NO.60				
NO.100	0.4	ラチ		11 %
NO.140		,		
NO.200	0,2	1.8		10,5
PAN	1.1	100		
TOTAL	10,9	1000		
REMARKS _				

FILE NO: RB19-2 SAMPLE NO: GRAIN SIZE CHART 170-173 BY: 2001 COARSE CLAY :: FINE 0.005 THEDIOT 000 GRAVEL SAND CLAY COARSE 0.05 Nº100 Nº200 Nº60 | Nº140 | MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE THED IOTH SAND - SIEVE SIZES COARSE N. 10 FINE GRAVEL MEDIUM DE SCRIPTION: COMMENTS W FINER BY WEIGHT

# KB19-2 170-173

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FILE NO:	
SAMPLE NO:	_
DATE:	
BY:	

	AST.M. D422-63.									
3TAQ 	ACTUAL TIME	ELAPSE TIME (MIN)	RH	TEMP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).		K	N (%)	N ₁ (%)
		1/2	9		9,7	0.068	14.7	كداه.	18.4	
		1	7.5		7.7	0.49	14.9	4	15.4	
		~	4.0		6.4	0.034	15,7	11	12,4	
		3	V.5	775	5.7	0,028	15.3	4	11.4	
		14	5.0		1.4	0.013	15.3	"	10,4	
	·	38	35		3.7	0.0080	15.5	"	7.4	
		85	30	26	3.4	4007/	15.6	10/24	6.8	
		245	2.5	265	7,3	00032	15.7	10/27	4.6	ļ
		485	2.5	25	1.6	2002}	15.7	.0129	3,2	
		1145	1.0	27	1,0	0.0015	16.0	.0126	20	
				,						
							<u> </u>			<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =;
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1 = (% < Nº60) N =N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R - \frac{100}{Us}$
REMARKS:

PE --

122-12

FILE NO:	
SAMPLE NO:	
DATE:	
2.44	

## - SIEVE ANALYSIS - BY:____

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.	·			
NO. 4				ي ن ن
NO. 10	(), T	7.		73.2
NO. 20	/	4		<i>î</i> 7,
NO.40	7.7	19.4		7
NO.60				
NO.100	110	22×3		
NO.140				
NO.200	5.2	10 U		3,70
PAN	/ = .	3 / 2		
TOTAL	500	1:3 :		

REMARKS_____

FILE NO: SAMPLE NO: GRAIN SIZE CHART DATE: COARSE 0001 CLAY FINE 0.005 001 MEDIUM GRAVEL SAND PILT COARSE 0.05 MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE 0.1 Nº100 **MEDIUM** SAND - SIEVE SIZES 0.5 COARSE N. 10 GRAVEL MEDIUM DE SCRIPTION: COMMENTS S FINER BY WEIGHT

## RB 19-3 180185

FILE NO:
SAMPLE NO:
DATE:
BY:

#### HYDROMETER ANALYSIS

A.S.T.M.	D422-63.
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,	, ASJ.III, D422-65.									
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).		K	Z (%)	N ₁ (%)
		1/2	17.5		17.8	0.064	13,2	1010	35,6	
			16		16.3	0.046	13.5	"	32.6	
		ν	15		15.3	0.033	13.7	11	30.6	
		3	14	27.6	14.3	0.027	13,1	"	28.6	
		14	12	/	12.3	0.013	14.2	11	24.6	
		54	9	78	9.4	0.0063	147	10/14	18.8	
		330	1.5	26	1:1	20027	15.2	10127	10.2	
		1285	2.5	28	2.9	00014	15.7	.0124	5.8	
				,				,		
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DESCRIPTION:
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < ,Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

RB19-3

whole sample

- SIEVE ANALYSIS -

FILE NO:
SAMPLE Nº:
DATE:
BY:

SIEVE	UEIGHT	PERCENT		E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
:10.10	0.8	1.6		97-
NO. 20	5.0	15.0		// <del>-</del>
NO.40	10,4	203		57 ,
140.60				
NO.100	12.1	2 - 2		4, -
NO.140				
NO.200	2.2	44		24.0
PAN	19 -	390		
TOTAL	500		<u> </u>	<u> </u>
REMARKS_				

RETRARKS

FILE NO: RB 19-4 SAMPLE NO: GRAIN SIZE CHART 191-200 0001 COARSE CLAY FINE 0.005 3 MEDIUM 001 GRAVEL SAND SILT COARSE N°200 M.T. CLASSIFICATION -GRAIN SIZE (MM)-FINE Nº60 | Nº14 MEDIUM SAND **S1ZES** - SIEVE COARSE GRAVEL **MEDIUM** DE SCRIPTION: COMMENTS % FINCE BY WEIGHT

## RB 19-4 141-200

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

### HYDROMETER ANALYSIS

AST.M. D422-63.

	AST.M. D422-63.									
3TAQ 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	RH= RH+ (CorCd)	METER		K	N (%)	Z_(%)
		1/2	+			0070	15.5	2010	8,6	
		1	3		3,3	0.049	15.6	"	6.6	
		2	1.5	27.6	1.8	0.035	15.9	"	3.6	
		3	1.5		1.8	0029	15.9	"	3.6	
		16	1.5	/	1.8	0.012	15.9	"	3.6	
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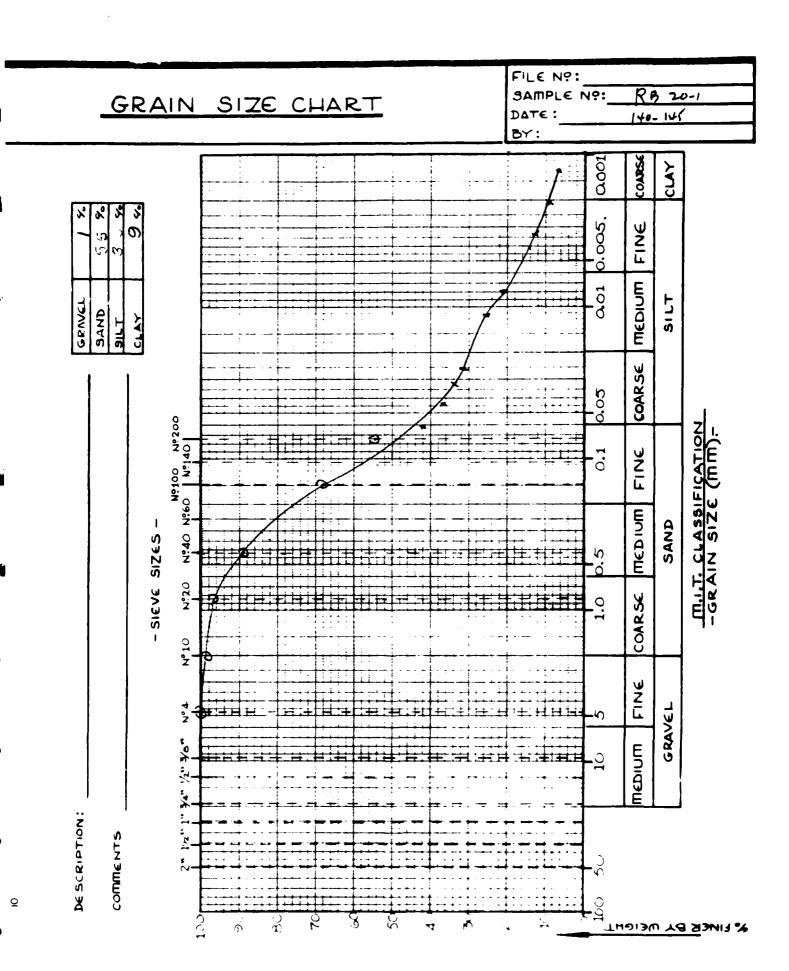
DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

R319-4

191-200 -SIEVE ANALYSIS -

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	I CUITILII ATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.				<del> </del>
1 IN.				
3/4 IN.				
1/z IN.				
3/8 IN.				
NO. 4				160,0
NO. 10	0,2	A <u> </u>		22 T 3
NO. 20	1.0			27.3
NO.40	5.7	20		13.2
NO.60				
NO.100	71.3	52.6		230
NO.140				
NO.200	8.1	15.2		7 4
PAN	スプ			
TOTAL	200	1000		
REMARKS _				



## RB 20-1 140-145

FILE NO:
SAMPLE NO:
DATE:
BY:

### HYDROMETER ANALYSIS

#### AST.M. D422-63.

<del></del>										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	TEMP. ℃	RH= CMCd	DIA- METER (m m).		K	N (%)	Z-(%)
		1/2	19.5		21.0	0.062	13.0	10/22	42	
		1	17		18.5	0,044	13.3	٧,	37	
		v	15.5	·	17.0	0,032	13.6	4	340	
		3	145	30.5	16.0	a026	13.8	,	32.0	
		14	11.0	_	12.5	0.012	14.3	',	25	
		33	9	/	10.5	0.0081	14.7	"	21.0	
		205	1,5	29.5	6.6	0,0033	15.2	10123	13,2	
		520	4.0	285	4.6	0.002/	15.0	10124	9,2	
		1330	3	28	3.4	0.0013	15.6	,,	6.8	
				`						
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						<u></u>				
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								<u> </u>	<u> </u>	<u></u>

DESCRIPTION:	
SPECIFIC GRAVITY; G: ASSUMED =	;CALCULATED =
MENISCUS CORRECTION, Cm:	
DISPERSING AGENT CORRECTION, Cd:_	
DRY LEIGHT OF SOIL, Us:	<b>_•</b>
% < N960 SIEVE:	_
% < Nº60 SIEVE :N (COMBINED	ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$	
REMARKS:	

KE -1-1

-SIEVE ANALYSIS -

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1500
NO. 10	, -i	0.5		392
NO. 20	1.1	22		37
NO.40	4	£		
NO.60				
N0.100	10.5	2/ 0		680
NO.140_				
NO.200	4.7	/3. ∠		74.3
PAN	273	= 4.6		<u> </u>
TOTAL	525	, · · • · · · · ·		
REMARKS				

FILE NO: SAMPLE NO: RB 20-2 GRAIN SIZE CHART 150-155 0001 CLAY FINE 0.005 **MEDIUM** 001 SAND 31LT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM); **MEDIUM** SAND SIZES - SIEVE COARSE FINE GRAVEL MEDIUM DE SCRIPTION; S FINER BY WEIGHT RB20-2 150-155

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

#### HYDROMETER ANALYSIS

AST.M. D422-63.

			A.S.T.	111.	422-6	<u> </u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH= CMCd	METER	1	K	Z (%)	N ₁ (%)
		1/2	1.0			0,20	16.0	4510	28	
		1	0.5		0.9	م اده ب	14.1	"	1.8	
		~	0.5	28	0.9	0035	16.1	1	1.8	
		55	05	28	0.9	0.0067	16.1	11	1.8	
		215	0.5	26.5	0.3	2500,0	16,1	10127	0.6	
		458	1,0	75	0.1	1.002K	14.0	10/29	0.2	
		1115	0	77	0	0.0015	16.3	10/26	0	
								<u> </u>	ļ	
								<u></u>		
								ļ		
										ļ
							<u></u>	<u></u>	<u> </u>	<u> </u>

DESCRIPTION:	-
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =	_
MENISCUS CORRECTION, Cm:	
DISPERSING AGENT CORRECTION, Cd:	-•
DRY WEIGHT OF SOIL, Us:	
%<, N960 SIEVE:	
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).	
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $	
REMARKS:	-

R320-2 150-155 What Signi -SIEVE ANALYSIS -

FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	- 0 -			1 200
NO. 20	2.3	0.6		1.
NO.40	2.5	17.6		
NO.60				
NO.100	3/3			- <u>-</u>
NO.140				
NO.200	2,4	4.5		
PAN	/ 2	5/2		
TOTAL	500			
REMARKS_				

FILE NO: SAMPLE NO: KB20-3 GRAIN SIZE CHART 170-160 0001 OARSE CLAY FINE 0.005 MEDIUM 001 GRAVEL SAND COARSE 0.03 Nº40 Nº60 | Nº140 | -GRAIN SIZE (MM)-0.1 FINE **MEDIUM** SAND - SIEVE SIZES COARSE N. 10 GRAVEL MEDIUM DE SCRIPTION: COMMENTS % FINER BY WEIGHT

# RB20-3 170-180

## HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

astm. D422-63

A.S.T.M. D.422-63.										
3TAD	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	R + = (Cor(Cd)	METER		K	N (%)	N, (%)
		1/2	35		365	0.056	10,4	10/12	43	
			32.5		34.0	0.040	10.8	1,	68	
		7	29,5		31.0	0.029	11.3	1,	62	
		3	17.5	30.5	29.0	0.024	11.6	4	58	
		14	72	/	231	0.011	12.5	4	47	
		41	17	/	18.5	0.0069	13,3	4	37	
		195	11	24,0	11.9	0,0033	14.3	10/13	23.8	
		510	9.5	285	10.1	0.0021	14.6	, 4214	20,7	
		1320	6	28	6.4	0.001]	152	11	12.8	
			L				<u> </u>			

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº 60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

KID - 7-2

- SIEVE ANALYSIS -

FILE NO:	_
SAMPLE NO:	_
DATE:	_
BY:	_

SIEVE	UEIGHT	PERCENT	CUMULATIV	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u>.</u> .	
1/2 IN.				
3/8 IN.				
NO. 4				100 -
NO. 10	2.	0.2		95
NO. 20		2		57. 1
NO.40		2 8		3.5 3
NO.60	ļ			
N0.100	-9.3	216		-7 4 4
NO.140				
NO.200	2	6		63-
PAN	34,2	6. 27. 4		
TOTAL	500	150 0		
REMARKS _				

FILE NO: RB-20-4 SAMPLE NO: GRAIN SIZE CHART 180-190 0001 COARSE CLAY FINE 0.005 MEDIUM 001 GPAVCL COARSE 0.05 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND **S126S** 0.5 - SIEVE COARSE GRAVEL THEDIUM DE SCRIPTION: STINER BY WEIGHT

## RB20-4 180-190

FILE NO:
SAMPLE NO:
DATE:
BY:

#### HYDROMETER ANALYSIS

#### A.S.T.M. D422-63.

			۲۱.۵.۱.		422-6	· · · · · · · · · · · · · · · · · · ·				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R + = R + + (Cor Cd)	DIA- METER (m m).		K	N (%)	Z-(%)
		1/2	29		30.5	and	11,4	. 1/22	61,0	
			27		28.5	0.042	11.7	()	57.0	
		ν	75		24.5	0.030	120	4	53,0	
		3	24	30.5	255	0.025	12,2	4	51,0	
		14	21	/	22.5	0.012	12.7	4	43.0	
		77	17.5		19.0	0.00 73	13,2	//	38.0	
		190	13	29.	14.5	0.0033	14,0	2122	29.0	
		505	10	285	10.6	0.0021	145	12124	21,2	
		1315	7	28	7.4	0.0013	15.0	10124	14.8	
				•						

DESCRIPTION:
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE: 111 = (% < Nº60) N =N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{US} = R $
REMARKS:

FILE NO:______

SAMPLE NO:_____

DATE:____

BY:___

### -SIEVE ANALYSIS -

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SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.	_			
3/8 IN.				
NO. 4				
NO. 10				1000
NO. 20	,	1.2		41
NO.40	1	3.4		95-
NO.60				
NO.100		12.6		828
NO.140			_	
NO.200	6.3	13.0		27.2
PAN	249	67.2		
TOTAL	500	1553		
REMARKS				
_				

FILE NO: RB 20-5 SAMPLE NO: GRAIN SIZE CHART 0001 COARSE CLAY ::: FINE 0.005 MEDIUM 001 GRAVEL COARSE 0.03 Nº500 Nº200 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND SIZES SIEVE COARSE GRAVEL TEDICE DE SCRIPTION: THOISO YOU BUNE

# RB 20-5 195-20U

### HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M.	D422-63.
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A3.1.111. D422-63.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R 4,= (Cor Cd)	METER		K	N (%)	N, (%)
		1/~	12		12,3	0.067	14.2	,0125	24.6	
			11		11.3	0.047	14,3	4	22,6	
		っ	9.5		9.8	0.034	14.6	4	19.6	
		3	9	27.6	9,3	a028	14.7	11	18.6	
		14	q		8.3	0013	14.8	1	16.6	
		60	5	28	5.4	0063	15.3	,0124	10.8	
		335	35	26	3.1	00027	15.5	1012	6.2	
		1290	U.Y	28	0.6	0.0014	16.1	,0124	12	
				,						
				<u> </u>						
								<u> </u>		
								<u> </u>	<u></u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < Nº 60 SIEVE :
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

## 213 20-5 125-202

FILE NS: SAMPLE NS: DATE:	
SAMPLE N?:_	
DATE:	
RV.	

-SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	3			1000
NO. 20	2	4		<i>₹.</i> ;
NO.40	12-1	20,2		フー
NO.60				
N0.1∞	22.1	40.2		35 5
NO.140				
NO.200	3. 3	7.6		277
PAN	12 )	250		
TOTAL	500	7329		
REMARKS _				

FILE NO: RB 21-SAMPLE NO: GRAIN SIZE CHART 130-140 DATE: COARSE 0001 **7** FINE 0.005 MEDIUM 001 GRAVEL COARSE N:40 N:60 | Nº140 | - GRAIN SIZE (MM)-0.1 FINE **MEDIUM** SAND - SIEVE SIZES COARSE MEDIUM DESCRIPTION: FINER BY WEIGHT

# 21-1

# 130-140

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

#### HYDROMETER ANALYSIS

#### AST.M. D422-63.

<u>,                                     </u>			<u> </u>		422-6	<u></u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	J€Wb	R 4 = (CMCd)	DIA- METER (m m).		K	N (%)	Z-(%)
		1/2	15.5		16.4	0.064	13.6	.0123	32.8	
		1	13,6		13.9	0.046	14.0	•,	27.8	
		~	12.0		129	003]	14,4	t,	25.8	
		3	11,0		11.9	0.027	14.3	",	23.8	
		14	8.5	29	9.4	0.013	14.7	4	14.8	
		35	7.0	-	7.9	60386	15.0	"	15.8	
		62	6.0	-	6.9	2,0061	15.4	"	13.8	
		170	4	24	4.9	00037	15.5	"	9.8	
		415	4	27	4.0	0.0024	15.5	NIO.	8.0	
		1375	3	28	3.4	00017	15.6	.0124	6.8	
				·						
										<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{US} = R \dots$
REMARKS:

21-1

FILE NO:	_
SAMPLE NO:	-
DΔTE:	_
a V·	

- SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 ½ IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				150,0
NO. 10	1.7	3.4		96.6
NO. 20	9.3	186		78.0
NO.40	5.5	11.6		67.0
NO.60				
NO.100	9.3	18.6		48.4
NO.140				
NO.200	4.3	8.6		39.8
PAN	19.9	39.8	<u> </u>	υ
TOTAL	50.0	100.0	<u> </u>	<u> </u>
REMARKS				

REMARKS

FILE NO: RB 21-2 SAMPLE NO: GRAIN SIZE CHART 170-180 D∆T€: C001 CLAY FINE 0.005 MEDIUM 000 GPAVEL SAND COARSE Nº40 Nº60 Nº140 | -GRAIN SIZE (MM)-FINE THED IUTH SAND SIEVE SIZES COARSE DE SURIPTION K FINER BY WEIGHT

# 21-2 170-180

FILE NO: SAMPLE NO:
SAMPLE NO:
DATE:
BY:

#### HYDROMETER ANALYSIS

AST.M. D422-63.

•			۸۵.۱۰	III. D	422-6	55.				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	RH= CMCd	DIA- METER (m m).		K	N (%)	N ₁ (%)
		14	3.0		3.9	0.069	15.6	, 6110,	7.8	
		١	2.0		2.9	0.049	15.6	**	1.8	
		7	2.0		2,9	0.035	"	4	18	
		3	1.5		2.4	0028	16.0	4	4. 1	
		14	1.5	24	1.4	0013	16.0	,	4.8	
		2.8	0	_	0.9	0.0065	16.3	3	1.8	
		170	-0.2	24	0.7			4,	1.4	
		440								
									ļ	
									ļ	
					<u> </u>					
							<u>.</u>			
									<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R $
REMARKS:

# 21-2 170-180

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATI	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	O			(00.0
NO. 20	0.5	1.0		99.0
NO.40	0.8	1,6		97,4
NO.60				
N0.1∞	33.0	66.0		31,4
NO.140				
NO.200	8.5	19.0		14.4
PAN	7,2	14.4		0
TOTAL	500	(50.0		
REMARKS				
•				

1604-1 FILE NO: SAMPLE NO: KB 22-/ GRAIN SIZE CHART 0001 CLAY 0.005 MEDIUM 0.01 GPAVEL SAND COARSE 0.05 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM); FINE **MEDIUM** SAND SIEVE SIZES COARSE FINE GRAVEL MEDIUM

4 FINER BY WEIGHT

22-1 95-105

FILE NO:
SAMPLE NO:
DATE:
DATE: BY:

## HYDROMETER ANALYSIS

A.S.T.M. D.422-63.

A.S.T.M. D.422-63.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	RHI= RH+ (CMCd)	DIA- METER (m m).		K	N (%)	Z-(%)
		1/2	23.5		23,9	190,	12.3	.0124	47.8	
		/	21.5	1	21.9	.044	12.6	4	43.8	
		2	19	1	19,4	103	13.0	4,	38.8	
		3	17	28	17.4	,026	13.3	4/	34.8	
		14	13	1	13.4	1012	14,0	",	26.8	
		47	9.5	28	9.9	10069	14.6	4	19.8	
		133	6.5	28	6.9	,0042	15.1	"	13,8	
	0/00	260	5.0	27	5.0	.0030	15.3	.0126	10,0	
	0730	650	4.0	24.5	3,0	10020	155	130ء،	6,0	
	1930	1370	1,0	28	1.4	10013	16.0	,0124	2.8	
									ļ	
									<u> </u>	<u> </u>

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE: $N_1 = \left(\frac{\% < N^{\circ}60}{100}\right)N = N \text{ (COMBINED ANALYSIS)}.$
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R - \frac{100}{Us}$
REMARKS:

12-1 95-105

- SIEVE ANALYSIS -

7

FILE NO:_	
SAMPLE NS	?:
DATE:	
BY:	

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/z IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			<u> </u>	
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	B -0-			1040
NO. 20	1.0	2.0		98.0
NO.40	4.7	9,4		\$ 8.6
NO.60				
NO.100	10.0	20.0		68.6
NO.140				
NO.200	8,0	16.0		20.5
PAN	26.3	52.6	<u> </u>	<u> </u>
TOTAL	F0.6	102.0		
REMARKS				
			· · · · · · · · · · · · · · · · · · ·	

FILE NO: 604-1 SAMPLE NO: 22-2 GRAIN SIZE CHART DATE: 0001 CLAY FINE 0.005 MEDIUM 000 SAND COARSE 0.03 -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE GRAVEL MEDICA DE SURIPTION:

K FINCE BY WEIGHT

# 72-2 140-145

FILE NO:	
SAMPLE	Nº:
DATE:	
BY:	

AST.M. D4	122-	6.	.5.
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			A) 2.1.		ひんとして	, _ ,				
DATE 19	ACTUAL TIME	(MIN)	R _H	T <i>€</i> mP. ℃	R 4,= (CMCd)	METER		K	2%)	2(%)
		1/2	8	_	8	.068	14.8	بالال	16	
		1	75	-	7.5	.048	14.9	4	15	
		z	7.0	/	7,0	.034	(5.0	4	14	
		3	6.5	27	6.5	,028	15.1	4	13	
		8	6.~	/	6,2	.017	15.2	"	12.4	
		180	3.0	26	2.6	.0637	15.6	10127	5.2	
		600	2.0	26	1.6	,0020	15.8	,,	3.2	
					<u> </u>			<u> </u>		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{US} = R $
REMARKS:

KB 22-2 140'-145'

- SIEVE ANALYSIS --

M

FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 111.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	0.7	1.4		98.6
NO. 20	7.3	14.6		84.0
NO.40	17.3	34,6		49,4
NO.60				
NO.100	12.(	24,2		25.2
NO.140				
NO.200	2,2	+.4		20.8
PAN	10.4	20.8		U
TOTAL	50.0	100,0		
REMARKS_				

1604-1 FILE NO: RB 22-3 SAMPLE NO: GRAIN SIZE CHART 175'-180 DATE: BY: COARSE 0001 CLAY 8 % 86% FINE 0.005 001 MEDIUM GRAVEL **74.1**2 SILT COARSE 0.03 Nº500 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE Nº 10 FINE GRAVEL MEDICA DE SCRIPTION: % FINER BY WEIGHT 22-3

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M.	D422763
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	AST.M. D422763.									
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	TEMP.	RH+ CmCd	METER		K	N (%)	(%)
		1/2	6.5		1068	6.9	15.1	.0124	13.8	
		1	6.0	/	1048	6.4	15,2	4	12.8	
		ν	5.0	/	1034	5.4	15,3	4	10.8	
		3	5.0	18	1028	5.4	15.3	4	10.8	
		14	4.5		1013	4,9	15.4	4	9.8	
		21	7.5		1011	4,9	15.4	4	9.8	
		118	3.5	28	.0045	3,9	15.5	٧	7.8	
	0/00	240	3.1	27	1003~	3,1	15.6	. जा ४	6,2	
	0730	630	3,8	245	10020	2.4	15.5	.0(30	5.6	
	1930	1350	1.0	28	10013	1.4	16,0	10/24	2.8	
				•						

DESCRIPTION
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

22-3 195-150

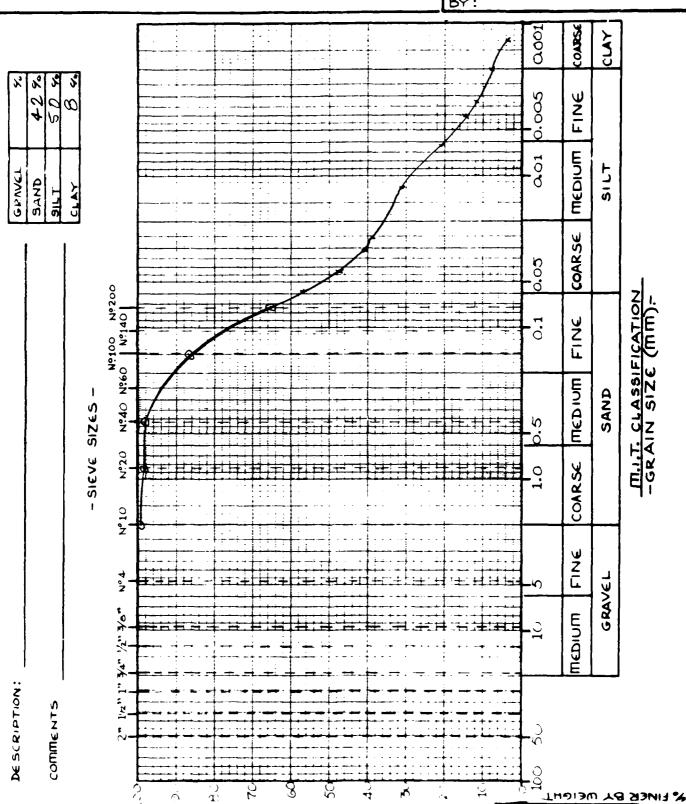
FILE NO:
SAMPLE NO:
DATE:
BY:

SIEVE	UEIGHT	PERCENT		LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	0.3	0.6		99.4
NO. 20	5,4	10.8		55.6
NO.40	20.0	40.0		486
NO.60				
NO.100	14.8	29,6		19.6
NO.140				
NO.200	1.8	3.6		15.4
PAN	7.7	15.4		U
TOTAL	50.0	100.0		
REMARKS				

## GRAIN SIZE CHART

1604-1 FILE NO: SAMPLE NO: DATE:

BY:



0

23-1 80-90

FILE NO:
SAMPLE NO:
DATE:
BY:

2040			A.S.T.	m. D	422-6	<u>.3.</u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> mP. ℃	RH= CMCd)	DIA- METER (m m).		K	2%	N ₁ (%)
		1/2	28	_	28.4	,059	11,5	,0124	56.8	
		/	24		24,4	1043	12,2	ч	48,4	
		ν	20	/	20.4	1031	12.9	4,	40.8	
		3	19	28	19.4	1026	13,0	c ₁	38.8	
		14	15	_	15.4	1012	13.7	1,	30.8	
		15	10	28	10.4	,0663	14,5	′,	20.8	
		140	7	28	7.4	10040	15.0	"	14.8	
	0/00	240	6	27	6.0	10033	15.2	.0126	12.0	
	0730	660	5,0	24,5	40	10020	15.3	.0130	8.0	
	1930	1380	1.5	28	1.9	10013	15.9	1270.	3.8	
			L							

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

23-1 50-90

FILE NO:	
SAMPLE NO:_	
DATE:	
RY	

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 10.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/2 IN.				
NO. 4				100.0
NO. 10	0.3	0.6		99.4
NO. 20	0.3	0.6		98.8
NO.40	0.5	1.0		97.8
NO.60				
N0.1∞	Sir	10,4		57.4
NO.140				
NO.200	//.3	22.6		67.8
PAN	32.4	64.8		U
TOTAL	50.0	100.0		
REMARKS				

# 1604-1 FILE NO: RB 23-2 SAMPLE NO: GRAIN SIZE CHART 155-160 0001 CLAY 26% 48% FINE ПЕРІОП 001 CPAVEL SAND COARSE 0.03 N°200 M.I.T. CLASSIFICATION -GRAIN SIZE (MM)-FINE Nº100 Nº60 | Nº14 THED IOTH SAND SIZES SIEVE COARSE PINE HEDICIE

S FINER BY WEIGHT

23-2 155-160

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

## HYDROMETER ANALYSIS

AST.M. D422-63.

AS.I.III. DARZE-63.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	R + = (CmCd)	DIA- METER (m m).		K	N (%)	N- (%)
		1/2	36	-	36,4	1056	10.2	.0124	72.8	
		1	34	-	34.4	1040	10.5	ч	68.8	
		ν	32		32.4	-00lox	10.9	7	64.6	
		3	30.5	28	30.9	-0,0041	[1.]	4	61.8	
		14	265	_	26.9	<b>0</b> 91	11.8	"/	53.8	
		43	22	28	22.4	.0067	12.5	4	44.8	
		129	18.5	24	18.9	.0039	13,1	11	37.8	
	0100	UT	16.0	27	16.0	10029	13.5	,0/26	32.0	
	0730	645	14.0	245	13.0	10019	13.8	.0130	26.0	
	1930	1365	14.0	29	14.4	10012	13,8	,0124	28.8	
				,						

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R + \frac{G}{G-1} \times \frac{100}{Us} = R$
REMARKS:

23-2 155-160

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN,				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	0.6	/, ~		98.8
NO. 20	1,7	3.4		95.4
NO.40	/, 3	2.6		92.8
NO.60				
NO.100	3.3	6.6		86,2
NO.140				
NO.200	25	5.0		81.~
PAN	40.6	81,2	<u> </u>	0
TOTAL	50.6	100.0	<u></u>	
REMARKS				
	_			

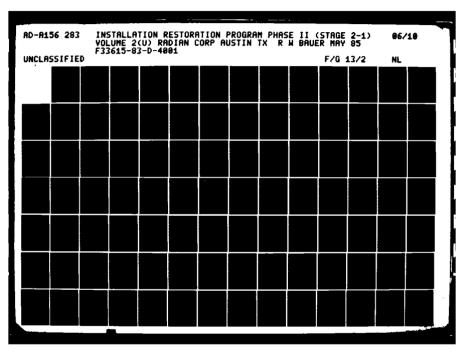
1604-1 FILE NO: SAMPLE NO: RB 23-3 GRAIN SIZE CHART 175-180 D∆T€: BY: 0001 COARSE CLAY 1:::-FINE 0.005 MEDIUM 001 SAND COARSE 0.05 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE Nº 10 GRAVEL MEDIUM DE SCRIPTION: S FINER BY WEIGHT

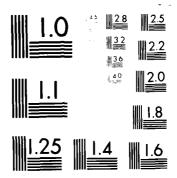
# 23-3 175-180

FILE NO:
SAMPLE NO:
DATE:
BY:

A.S.T.M. D422-76-3.										
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	τεπΡ. ℃	RH+ CMCd	METER		K	N (%)	N ₁ (%)
		1/2	18		1064	18,4	13,2	.0124	36.8	
		/	17	-	1045	17.4	13.3	′/	34.8	
		ン	16		1032	16.4	13.5	′/	32.8	
		3	15	28	طده،	15.4	13,7	"/	30.8	
		14	125		.012	12,9	14.1	٠,	25.8	
		35	10,0	28	.0078	10.4	14.5	"	20,8	
		12	7.5	28	10043	7.9	14.9	"	15.8	
	6/02	245	6.0	27	10031	6,0	15.2	.0/26	12.0	
	0730	635	6,0	24,5	10020	5.0	15.2	10130	10,0	
	1930	1355	2.0	28	10013	2.4	15.8	.0124	78	
							ļ			

ESCRIPTION:
SPECIFIC GRAVITY; G : ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,N960 SIEVE:
$N_1 = \left(\frac{\% < N^{\circ}60}{100}\right)N = N \left(\text{COMBINED ANALYSIS}\right).$
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:
ORY WEIGHT OF SOIL, $U_9$ : $N_1 = \left(\frac{\% < N\%60}{100}\right)N = N \text{ (COMBINED ANALYSIS)}.$ $N = R \frac{G}{G-1} \times \frac{100}{US} = R$



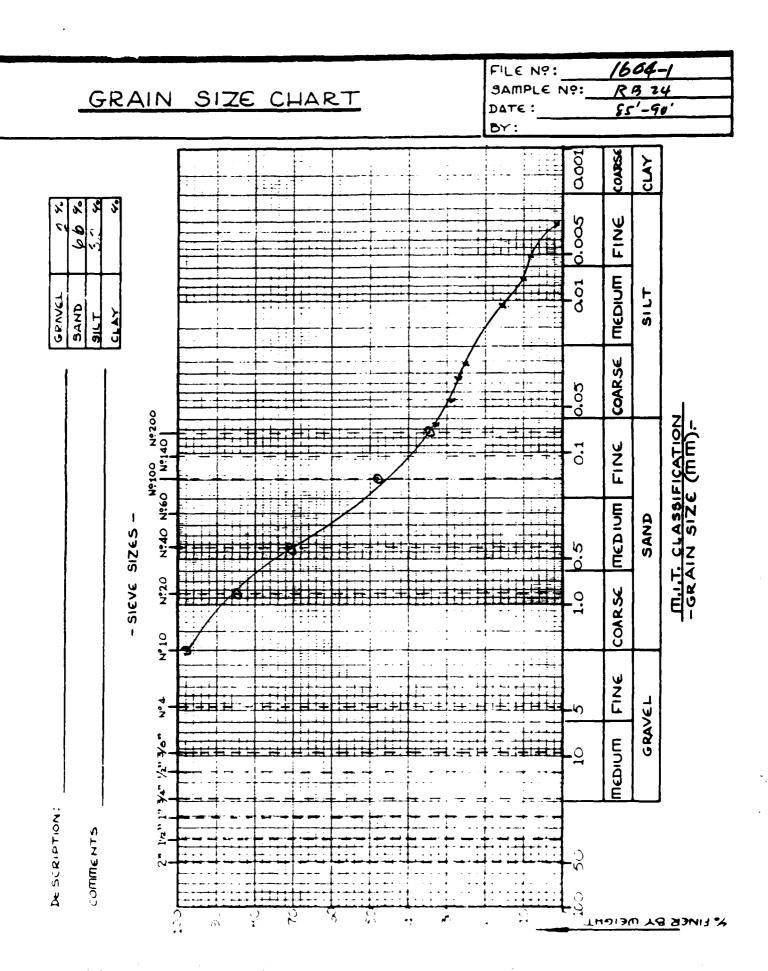


MICROCOPY RESOLUTION TEST CHART NATIONAL HORAL CHART

23-3 175-150

FILE NO: SAMPLE NO: DATE:	
SAMPLE NO:	
DATE:	
av.	

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2, IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	6.6	13.2		56.8
NO. 20	12.1	24,2		626
NO.40	2.3	4.6		1-8.0
NO.60				<u> </u>
NO.100	5,0	10,0		48.0
NO.140				
NO.200	2,4	4.8		432
PAN	21.6	43,2		U
TOTAL	10.0	(00.0		
REMARKS				
_			<del></del>	



RB-74 85-90

FILE NO:
SAMPLE NO:
DATE:
BY:

1155			A.S.T.	m. D	122-6	3.				
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H		RH= RH+ (Corcd)	DIA- METER (m m).		K	2	N ₁ (%)
		1/4	15		14.3	0.0.64	13.8	, 0/22	32,6	
		/	13		14.3	0.046	14	",	28.6	
		~	12		13,3	0.033	14,4	4	26 6	
		3	11		12.3	0.027	14,3	4	24.6	
		19	hs	30	7.8	0011	12'1	4	15.6	
		44	3.5	/	4.8	20072	15.5	7	9.6	
		90	3,0	29	3,9	01051	15.6	10/23	7.8	
	0400	XU	O	24	0.4	00032	14.3	.0124	0.8	
	0930	280	U	27	0	0.0030	143	.016	٥	
	2030	1240	-1	30	0.3			10/22		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < ,N960 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

R13 24 St-90

FILE NO:______
SAMPLE NO:_____
DATE:_____
BY:____

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED , g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.			<u> </u>	
3/8 IN.				
NO. 4				1000
NO. 10	1.~	2,4		-176
NO. 20	6.2	12.4		65.2
NO.40	7.3	14.6		70.6
NO.60				
NO.100	11.2	22,4		487
NO.140	<u> </u>			
NO.200	6.7	13.4		748
PAN	174	=46	<u> </u>	<u>'</u>
TOTAL	JU.0	1030	<u></u>	<u> </u>
REMARKS				

604-1 FILE NO: SAMPLE NO: RB 24-2 GRAIN SIZE CHART 95'-160' DATE: 0001 COARSE CLAY FINE 0.005 MEDIUM 000 GRAVEL SAND COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE 0.1 **MEDIUM** SAND SIZES SIEVE COARSE GRAVEL MEDIUM DE SCRIPTION K FINER BY WEIGHT

## RB 24-2 95-110

#### HYDROMETER ANALYSIS

FILE NO: SAMPLE NO:	
SAMPLE NO:	_
DATE:	
BY:	

1225 AST.M. D422-63. RH- DA-ELAPSE N, (%) TEMP Ru + METER N (%) STAG ACTUAL TIME RH (MIN) TIME 1/2 14.3 0.065 28.6 13 14.0 .0122 13.8 0.046 14.0 27.6 12.5 17 13.3 0.033 14.2 26.6 3 11 12,3 14.3 24,6 0.027 11 15 30 10.8 0.011 14.5 21.6 7.0 8.3 50 15.0 16.6 0.0067 V.4 5.8 24 0400 220 15.3 , 6124 11.6 00033 250 50 5.0 0980 ~7 15.3 .0126 0,003/ 10,0 1210 30 3,3 15.8 10122 6.6 2030 2.0 0.0014

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº 60 SIEVE :
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{US} = R \frac{1}{100}$
REMARKS:

RB 24-2

95-110

FILE N?:______

SAMPLE N?:_____

DATE:_____

BY:_____

SIEVE	VEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			·	
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	0.6	7, 2		مسم، م
NO. 20	5.8	11.6		23 2
NO.40	12.4	24.7		32.0
NO.60				
NO.100	13.6	27.2		35.2
NO.140				
NO.200	1.7	3,4		317
PAN	1.7	3 1. p	<u> </u>	<u> </u>
TOTAL	50.0	100		
REMARKS _				

1604-1 FILE NO: RB 24-3 SAMPLE NO: GRAIN SIZE CHART 120'-130' DATE: BY: COARSE FINE MEDIUM 001 GRAVEL SAND COARSE MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINE MED IUM SAND SIEVE SIZES COARSE GRAVEL MEDIUM DE SCRIPTION:

W FINER BY WEIGHT

RB 24-3 120-130

FILE NO:	
ISAMPLE NO:	
DATE:	
BY:	

1205			AST.	m. D	422-6	.3.				
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	℃ TEMP.	RH= RH+ (Corcd)	DIA- METER (m m).		K	Z (%)	N, (%)
	ō	1/1	4,5		5.8	0.067	15.3	10/22	11.6	
		1	4,0		5.3	0.048	15.5	4	10.6	
		4	3,0		4.3	0.034	15.6	4	8,6	
		3	2.0		3, 3	0.028	15.8	4	6.6	
		61	2.0	30	3. 3	0.915	15.8	4	6,6	
		36	1,0		2.3	0.0081	16.0	7	4,6	
		80	٥	21	0.9	20055	16.1	.0123	1.8	
	0400	240	0	21	0.4	0.4132	16.1	10124	0.8	
	0930	270	0	27	U _.	0.0031	16.1	.0126	0	
	2030	1230	-1	30	0.3	0.0014	16.3	. DI-2	0.6	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
%<, Nº60 SIEVE:
% < Nº60 SIEVE : N1= (% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

# RB 24-3

120 - 130

FILE NO:	
SAMPLE NO:	
DATE:	<del></del>
a V·	

SIEVE	UEIGHT	VE PERCENT		
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.			<u></u>	
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	2.9	- 37		942
NO. 20	4.8	7.6		2-, ,
NO.40	12.8	256		59 /
NO.60				
NO.100	18.5	37.0		22
NO.140		, , , , , , , , , , , , , , , , , , ,		
NO.200	3.3	56		15.4
PAN	7.7	1.7.6		<u> </u>
TOTAL		1600		<u></u>
REMARKS				

FILE NO: RB 25-1 SAMPLE NO: GRAIN SIZE CHART 150-160 0001 COARSA CLAY  $\vdots : \vdots$ FINE 0.005 001 MEDIUM GRAVEL BAND 31LT COARSE 0.05 Nº 200 MILT. CLASSIFICATION -GRAIN SIZE (MM)-FINC 00 N **2** 09:N THED IUM SAND **S126S** - SIEVE COARSE N. 10 FINE GRAVEL **MEDIUM** DE SCRIPTION: COMMENTS % FINER BY WEIGHT RB25-1 150-160

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

AST.M.	D422-	63.
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•			A.S.I.	111.	422-6				<del>, , , , , , , , , , , , , , , , , , , </del>	
DATE 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH+ (Corcd)	METER		K	Z (%)	N, (%)
		1/2	10.5		10.9	9.087	14.4	1100	218	
			8.5		8.9	0.048	14.7	4	17.8	
		γ	6.0		6.4	0.034	15,2	7	12.8	
		3	5.4	28	5.6	4028	15.3	"	11,2	
		14	4,0		4.4	0013	15.5	4	8.8	
		TY	3	24	34	0.057	15.6	,	6.8	
		235	3	76.5	2.8	0.0033	15.6	10127	5.6	
		475	3	25	2./	0.002)	15.6	10129	4,2	
		1135	1.5	27	1,5	0.0015	15.9	10126	3,0	
			-							
							<u> </u>		<u> </u>	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL, Us:
% < ,N960 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \frac{1}{Us}$
REMARKS:

RB 25-1 150-160

-SIEVE ANALYSIS -

	=
FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 lN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1100
NO. 10	04	0.5		772
NO. 20	1,7	3 (		75.
NO.40	5.0	100		
NO.60				
NO.100	21.0	42.0		-35
NO.140				
NO.200	2.5	15.6		~ ^ 2
PAN	14/	2 2		
TOTAL	40.0	1.11.6		
REMARKS				

### FILE NO: SAMPLE NO: RB 25-3 GRAIN SIZE CHART 187-190 0001 COARSE CLAY FINE 0.005 **MEDIUM** 001 GRAVEL 74.2 SILT COARSE 0.03 Nº500 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-0.1 FINE **MEDIUM** SAND **S126S** - SIEVE COARSE N. 10 FINE GRAVEL MEDIUM % FINER BY WEIGHT

## RB75-3 187-190 HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M. D422-63

			AST.	III. D	<u> 422-6</u>	<u> </u>				
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	TEMP.	Ru+ Corcd	DIA- METER (m m).		K	2 (%)	N ₁ (%)
		1/4	20		20,3	0.064	12.9	iohrs	40,6	
		/	17.5		17.8	0.045	13.7	4	35.6	
		7	16		14.3	4032	13.5	1	32.6	
		3	15	27.6	15.3	0.027	13,7	4	30.6	
		14	12	_	12,3	0.013	14,2	4	24.6	
		34	10		10.3	00082		"	20.6	
		H	8.5	28	8.9	0.005 J	14.7	,0(24	17.8	
		345	6,0	26	56	0.0024	15.2	. 0127	11.2	
		1300	3.0	28	3.4	2.00 KL	15.6	10124	6.8	
				`						
							<u> </u>			
							L			

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB 25-3 187-190

- SIEVE ANALYSIS -

FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

3 IN.  2½ IN.  2 IN.  1½ IN.  1 IN.  3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10		SHT	PERCENT	CUMULATIN	VE PERCENT
2½ IN. 2 IN. 1½ IN. 1 IN. 3/4 IN. 1½ IN. 3/6 IN. NO. 4 NO. 10 NO. 20 NO. 20 NO. 40 NO. 60 NO. 60 NO. 100 1/2.4 NO. 100 1/2.4 NO. 100 1/2.4 NO. 100 NO. 200 NO. 200 NO. 200 NO. 300 NO. 400 NO. 400 NO. 500 NO. 100 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1/2.4 NO. 1	ZE RET	D, g.	RETAINED	RETAINED	PASSING
2 IN.  1 1½ IN.  1 IN.  3¼ IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  NO. 20  NO. 20  NO. 40  NO. 60  NO. 60  NO. 100  1/2 IV.  2 IV.  2 IV.  3/8 IV.  1/2 IV.  3/8 IV.  1/2 IV.  2 IV.  1/2	IN.				
1 ½ IN.  1 IN.  3/4 IN.  1/2 IN.  3/6 IN.  NO. 4  NO. 10  NO. 20  NO. 20  NO. 40  NO. 60  NO. 100  1/2.4  NO. 100  1/2.4  NO. 100   IN.					
1 IN.  3/4 IN.  1/2 IN.  3/6 IN.  NO. 4  NO. 10  NO. 20  NO. 20  NO. 40  NO. 60  NO. 100  17.4  2 1  NO. 100  NO. 100  17.4  2 1  NO. 100  NO. 100  17.4  2 1  NO. 100  NO. 100  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.4  17.	IN.				
3/4 IN.  1/2 IN.  3/8 IN.  NO. 4  NO. 10  NO. 20  NO. 20  NO. 40  NO. 60  NO. 100  17. 4  2 1  NO. 100  NO. 100  17. 4  2 1  NO. 100  NO. 100  17. 4  2 1  17. 4  2 1  18. 4  18. 4  18. 4  18. 50.0	IN.				1
1/2 IN.  3/8 IN.  NO. 4  NO. 10  NO. 20  NO. 20  NO. 40  NO. 60  NO. 60  NO. 100  19. 4  2. 1  NO. 140  NO. 140  NO. 200  PAN  2. 1  TOTAL  3 C. 0	IN.				
3/8 IN.  NO. 4  NO. 10  -0-  NO. 20  0.3  0.6  NO. 40  NO. 40  NO. 60  NO. 100  19.4  2.1  NO. 140  NO. 200  9.0  17.2  PAN  TOTAL  50.0	IN.				
NO. 4  NO. 10  -0-  NO. 20  NO. 40  NO. 40  NO. 60  NO. 100  17.4  21  NO. 100  NO. 140  NO. 200  PAN  21 7  TOTAL  50,0	IN.				
NO. 10	IN.				
NO.20  NO.40  NO.60  NO.100  17.4  21  NO.140  NO.200  9,0  122  PAN  TOTAL  50.0	4				
NO.40  NO.60  NO.100  17.4  2 2  NO.140  NO.200  PAN  2 3  TOTAL  5 0,0	0				1000
NO.60  NO.100  17.4  34.7  NO.140  NO.200  PAN  21.3  TOTAL  50.0	20	3	0.6		5 ÷ C
NO.100 19.4 34.5 NO.140  NO.200 9.0 12.5  PAN 21.3  TOTAL 50.0	10	7	2 🔅		:
NO.140  NO.200 9,0 12 2  PAN 213  TOTAL 50,0	50				
NO.200 9,0 12 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	$\infty$	, 4	24.3		
PAN 2/3 TOTAL 500	40				
TOTAL 50,0	$\infty$	U	120		2
	2	9			
REMARKS	AL _	, 0	1.		
	≀KS				

FILE NO: RB 26-2 SAMPLE NO: GRAIN SIZE CHART 140-150 DATE: COARSE 0001 Ç¥3 FINE 0.005 MEDIUM 001 CPAVCL BAND **XV1**5 SILT COARSE 0.03 -GRAIN SIZE (MM)-FINE 0.1 Ne100 **MEDIUM** SAND - SIEVE SIZES COARSE N. 10 GRAVEL **MEDIUM** DE SCRIPTION: COMMENTS K FINER BY WEIGHT

# RB 26-2 140-150

117	1 D	R	DΠ	16	TE	R	ANAL	YS	IS
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FILE NO:
SAMPLE NO:
DATE:
BY:

AST.M. D422-63

			A.S.T.	III. U	422-6	55.				
3TAD 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	Ru+ Corcd	METER	1	K	2%)	N, (%)
		1/2	27		27.3	0.060	11.7	.0/25	54.6	
		1	24		24.3	0.04K	12,2	1,	48.6	
		γ	22		22.3	0.031	12.5	11	44.6	
		3	20	27.6	20.3	0.026	12.9	"	40,6	
		14	17.5	_	17.8	0.012	13,2	"	35.6	
		38	132		14.5	0.0076	14.0	"	270	
		80	10	28	10.4	0.0053	14.5	,0124	20.8	
		350	6.5	n	4.1	0.0026-	15.1	10127	12.2	
		1305	2.0	28	2,4	0.0014	15.8	. 4214	4.8	
				<u> </u>						
				•						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < N960 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

RB 26-2

140-150

- SIEVE ANALYSIS -

FILE NO:	
SAMPLE Nº:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				182 2
NO. 10	0.4	0.8		992
NO.20	119	3.8		٥.
NO.40	7.3	6.6		'ر بوئر
NO.60				
NO.100	6.0	120		76 -2
NO.140				
NO.200	4.8	15.6		312
PAN	30.5	£ 1.2		
TOTAL	500	1500		
REMARKS _				

FILE NO: SAMPLE NO: RB 26-3 GRAIN SIZE CHART BY: COARSE 0001 770 FINE 0.005 MEDICA 000 SILT GRAVEL CLAY PILT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE 1.0 Nº 10 FINE GRAVEL MEDICIT K FINER BY WEIGHT

## RB 26-3 200

#### HYDROMETER ANALYSIS

AST.	m l		12	2-	6	ጜ.
		_	~	•	۰	·

			۲۱٬۵۰۱۰							
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	RH+ (Corcd)	METER	1	K	N (%)	N, (%)
		1/4	7		1.3	0.069	15,3	.015	10.6	
			4		4.3	0.049	15.5	"	8.6	
		Z	3	27.1	3,3	0.035	15.6	1,	6.6	
		3	2	1	2,3	0.029	15.4	",	4.6	
		14	1.5		1.8	1.014	15.9	"	2.6	
		,								
								<u> </u>		

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº 60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{IOO}{US}=R$
REMARKS:

PB 20-3

- SIEVE ANALYSIS -

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1.1

FILE NO:	
SAMPLE NO:	_
DATE:	-
BY:	

SIEVE	<b>UEIGHT</b>	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	<i>D</i>			1000
NO. 20	2.1	1.8		922
NO.40	7.7	19,4		
NO.60				
NO.100	20.74	41.4		37 4
NO.140				
NO.200	5.5	11.0		23
PAN	13.2	76.4		
TOTAL	50.0	1500		
REMARKS				
-				

FILE NO: SAMPLE NO: KB 27-1 GRAIN SIZE CHART 150-160 DATE: 0001 COARSE CLAY FINE MEDIUM 001 GRAVEL SAND COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-0.1 FINE **MEDIUM** SAND - SIEVE SIZES COARSE FINE GRAVEL MEDIUM DE SCRIPTION: COMMENTS S FINCE BY WEIGHT

# RB27-160

FILE NO:	
SAMPLE NO:	
DATE:	
BY.	

### HYDROMETER ANALYSIS BY:

AST.M. D422-63.

<del></del>			<u> </u>							
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	7 <i>€</i> mP. ℃	RH= RH+ (Corcd)	DIA- METER (m m).		K	Z(%)	N ₁ (%)
		ル	34		31,2	0.055	97	.ohs	78.4	
		1	36		36.2	0.040	10.7	"	72.4	
		v	33,5		33,7	0.029	10.7	"	67.4	
		3	31	275	31,2	0.624	11.1	4	62.4	
		14	25	1	25,2	0.0/2	12.0	"	50.4	
		47	145	-	18.7	0.0071	13,1	,	37.4	
		90	13.5	28	13.7	20049	13.9	,0124	27.4	
		750	9	26.5	8.8	0003/	14.7	,0127	17.6	
		490	7	25	6.1	0.602]	15.0	0129	12.2	
		1150	4	77	4.0	0.0015	15.5	10126	8.0	
									<u></u>	
									<u></u>	<u></u>

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1=\big(\frac{\infty < Nº60}{100}\rm \right) N = N (COMBINED ANALYSIS).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

3 IN. 21/2 IN. 2 IN.	RETAINED, g.	RETAINED	RETAINED	PASSING
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.			,	
1/2 IN.				
3/8 IN.				
NO. 4				100 2
NO. 10		00		17.
NO. 20	1,5	10		11.5
NO.40	0.17	/ 2		77
NO.60				
NO.100		7.2		<u> </u>
NO.140				
NO.200	4 1	£ 14		2
PAN	4,, 9	F 1. P		
TOTAL	(0.0	12.6		
REMARKS_				

FILE NO: RB27-2 SAMPLE NO: GRAIN SIZE CHART 110-190 0001 COARSE CLAY FINE 0.005 MEDIUM 001 SILT SAND CLAY PILT COARSE 0.03 -GRAIN SIZE (MM)-PINE 09:N **MEDIUM** SAND - SIEVE SIZES COARSE N. 10 FINE GRAVEL **MEDICA** 

% FINER BY WEIGHT

# RB Z7-2 180-190

FILE NO:
SAMPLE NO:
DATE:
BY:

#### HYDROMETER ANALYSIS

AST.M.	D422-63.
<b>~</b> \~	D-7 000

,	AST.M. D422-65.									
DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€mP. ℃	RH;= RH+ (Corcd)	DIA- METER (m m).		K	Z (%)	N ₁ (%)
		1/2	30.5		32	6.057	11.1	,0122	64	
		1	28		29.5	0.041	11.5	t,	59	
		7	25		26.5	0.030	12,0	3	53	
		3	23	30.5	245	0,025	12,4	4	49	
		14	19	/	20.5	1012	13.0	4	41,0	
		29	16	/	17.5	0.1183	13.5	',	35	
		200	9	295	10.1	0.0033	14.7	,0123	20.2	
		515	7.5	28.5	8.1	0.002/	14.9	.0124	16,7	
		1325	3	28	5.4	0.0013	1513	"	10.8	
				`						
								<u> </u>	<u> </u>	

DESCRIPTION:	
SPECIFIC GRAVITY; G: ASSUMED =; CALC	ULATED =
MENISCUS CORRECTION, Cm:	
DISPERSING AGENT CORRECTION, Cd:	,
DRY WEIGHT OF SOIL, Us:	
% < Nº60 SIEVE:	
% < Nº60 SIEVE :	15).
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$	
REMARKS:	

RB27-2 180-190

- SIEVE ANALYSIS -

FILE NO:	_
SAMPLE NO:	_
DATE:	_
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10				1500
NO. 20	0.2	0.4		975
NO.40	0.6	/ 2		922
NO.60				
NO.100	6.8	3.6		مي ي نړ
NO.140				
NO.200	6.4	2,(		72 ,
PAN	<b>3</b> 5.2	72.6		
TOTAL	50.0	1 11	l	
REMARKS				
•				

FILE NO: KB 27-3 SAMPLE NO: GRAIN SIZE CHART 190-195 DATE: 0001 COARSE **C**A√ ::: 78% FINE 0.005 MEDIUM 001 GPAVCL SAND **74.12** SILT COARSE 0.03 Nº100 Nº200 Nº60 | Nº140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND - SIEVE SIZES COARSE °1 € FINE GRAVEL MEDICIE DE SCRIPTION: COMMENTS K FINER BY WEIGHT

# RB 27-3 190-195

FILE NO:	
SAMPLE NO:	_
DATE:	_
BY:	

## HYDROMETER ANALYSIS

AST.	Π.	D	42	2-	63	5.
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			A.S.T.	···. D	422-6	<u> </u>				
3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T£mP.	R 4 = (Cor(Cd)	DIA- METER (m m).		K	2%	N ₁ (%)
		1/2	11		12.5	0,0,65	14.3	10/22	25.0	
		1	7		8.5	0.047	15.0	11	17.0	
		ν	1.5		7.0	0.034	15,2	11	140	
		3	3.5	305		0.028	15.5	(1	10,0	
		14	3.5		5.0	0.013	15,6	4	10.0	
		181	1,0	29.0	1.9	0.0036	16.6	10/23	3.8	
		500	1,0	28.5	1.6	0.0022	16.0	.0124	3.2	
		1310	10	28	1.4	0.004	16.0	10124	2,8	
								,		
			ļ	,						

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL . Us:
% < Nº60 SIEVE :
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

K327-2

190-195

- SIEVE ANALYSIS -

_	
	FILE NO:
	SAMPLE Nº:
	DATE:
	BY:

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10				10-
NO.20	02,	6.6		
NO.40	0,9	.5		
NO.60				
N0.100	218	- 7.3		5-
NO.140				
NO.200	12.2	544		29 -
PAN		337		
TOTAL	50.0			
REMARKS				

FILE NO: SAMPLE NO: RB 28-1 GRAIN SIZE CHART 120-175 COARSE 2001 CLAY FINE 0.005 **MEDIUM** 001 SAND **21.2** SILT COARSE 0.03 Nº 200 -GRAIN SIZE (MM)-FINE Nº 10099N **MEDIUM** SAND **S1265** - SIEVE 1.0 COARSE N. 10 FINE GRAVEL MEDICA DE SCRIPTION: % FINER BY WEIGHT RB28-1 121-125

#### HYDROMETER ANALYSIS

FILE NO:	
SAMPLE NO:	_
DATE:	_
BY:	

AST.M.	0	122	-6	~
<b>4</b> 1.3.1.111.	IJ	<b>ムトム ム</b>	.– ഗ	$\supset$

DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH= RH+ (CMCd)	DIA- METER (m m).	1	K	2%	N ₁ (%)
		1/2	38		78.3	0.056	9.9	10/25	78,6	
			345		34.8	0040	10.4	1,	69.6	
		γ	31		31.3	0029	11.1	4	62.6	
		3	29	27.6	29.3	0024	11.4	"	58.6	
		14	235		23.1	0012	12.3	7	\$7.6	
		46	18.8	-	19.1	0.0066	13,0	"	38.2	
		90	16.2	28	16.6	40048	13.5	. 0124	132	
		360	12	76	11.6	0.0025	14,2	10127	23.2	ļ
		1315	7.5	28	7.9	0.0013	14.9	10124	15.8	
				`						<b></b>
						ļ				
									<u> </u>	

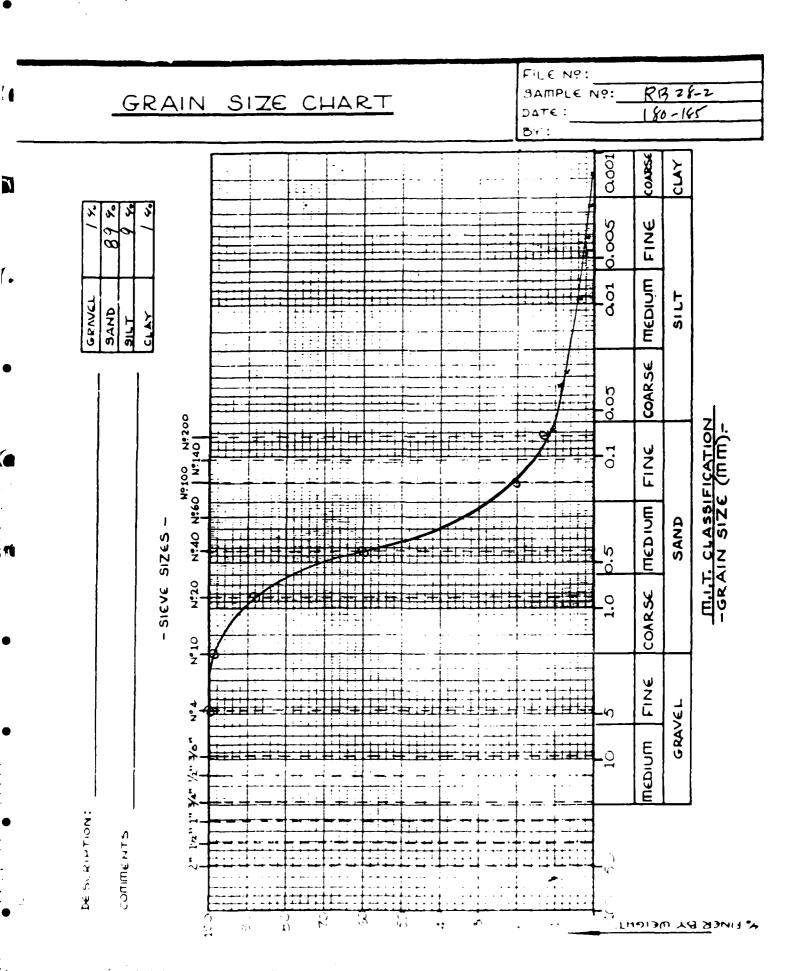
DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < N960 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

\$2,78-1 120-75

## Likali Skiple (of juden -SIEVE ANALYSIS-

FILE NO:	
SAMPLE Nº:	
DATE:	<u> </u>
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	E PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.			Ì	
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10				
NO. 20	-6-			1.2.
NO.40	O, v	O. U		5.,
NO.60				
NO.100	7.9	4		
NO.140				
NO.200	6.0	12.0		
PAN	-19	2 ,		
TOTAL	50.0			
REMARKS_				



## RB 28-V 180-185 HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

#### AST.M. D422-63.

DATE 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T€MP. ℃	RH= RH+ Corcd	DIA- METER (m m).		K	28)	Z-(%)
		$//_{\nu}$	14		5.5	1.088	15,5	, oin	11.0	
		1	/		_	• , , (,		"	_	
		1	3		4.5	4.034	15.6	7	9.0	
		3	7	30.5	35	0.028	15.8	4	7.0	
		28	0.5	/	2.0	20092	16.0	4	40	
		180	0	29	0.9	40017	16.3	1 4123	1.8	
		495	0	285	0.6	2002]	16.3	. 0124	1.2	
		1305	U	21	0.4	10011	16.3	11	0.8	

DESCRIPTION:
SPECIFIC GRAVITY; G: ASSUMED =; CALCULATED =
MENISCUS CORRECTION . Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY LEIGHT OF SOIL . Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

R12, 28.2 180-185 -SIEVE ANALYSIS -

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	= <del></del>
FILE NO:	
SAMPLE NO:	
DATE:	
BY:	

SIEVE	UEIGHT	PERCENT	CUMULATIN	VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1000
NO. 10	0.6	1, 7		488
NO. 20	5.2	10.4		3 K W
NO.40	1-2-	28.4		600
NO.60				
N0.100	70.0	40.0		200
NO.140				
NO.200	3.6	7.2		72,7
PAN	64	12.5		<u> </u>
TOTAL	400	ן לדל		

FILE NO: SAMPLE NO: RB 29-1 GRAIN SIZE CHART 0001 COARSE CLAY 50% FINE 0.005 **MEDIUM** 001 CPAVCL SAND CLAY SILT COARSE 0.03 Nº 100 Nº 200 Nº 160 | Nº 140 | -GRAIN SIZE (MM)-FINE **MEDIUM** SAND S126.5 - SIEVE COARSE Nº10 FINE GRAVEL MEDICA DE SCRIPTION: COMMENTS K FINER BY WEIGHT

# RB29-1

## 135-145

#### HYDROMETER ANALYSIS

FILE NO:	
SAMPLE NO:	_
DATE:	
BY:	

AST.	M.	D	42	2-	6	3.
		_	_, _	_	·	-

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3TAD 	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>€</i> mP. ℃	R + = R + + (Cor Cd)	DIA- METER (m m).	1	K	2%	2(%)
		1/2	37		36.8	v.a52	10.1	10/22	7.7,6	
		1	33.5		35.3	0,040	10.6	4	70.6	
		~	30		34.8	0.029	1112	4	63.6	
		3	285	31	30.3	0.024	11.4	17	60.6	
		14	23	/	24.8	0.01/	12,4	4	49.6	
		45	20	/	2/.8	0.0065	12,9	"	43.6	
		95	18	29	18.9	20046	13,2	<i>דרוט</i> ו	37.8	
		255	17	26.5	14.8	0.6029	13.3	.0127	33.6	
		495	16	35	15.1	0.002/	135	,0129	30.2	
		1155	14	27	14.0	0.0014	13.8	10126	28.0	

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
%< Nº60 SIEVE:
% < Nº60 SIEVE :
$N = R \frac{G}{G-1} \times \frac{100}{Us} = R \underline{\hspace{1cm}}$
REMARKS:

FILE NO:	
SAMPLE NO:_	
DΔΤΕ:	
BY:	

#### - SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIN	LE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASS'NG
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				1:3.
NO. 10	J. i	c. Z		338
NO. 20		06		332
NO.40	/	2		932
NO.60				
NO.100		5.4		₹ व
NO.140				
NO.200	, ,	f 0		23.5
PAN	3	03.0		<u> </u>
TOTAL	200	1:50		
REMARKS				

FILE NO: SAMPLE NO: RB 29-2 GRAIN SIZE CHART 150-160 DAT€: BY: 2001 COARSE CLAY :::-FINE 0.005 Ø 37 **MEDIUM** 001 GPAVEL SAND **CLAY** SILT COARSE 0.03 Nº500 Nº200 -GRAIN SIZE (MM) 0.1 FINE MED IUM SAND - SIEVE SIZES 0.5 COARSE N. 10 FINE GRAVEL MEDIUM DE SCRIPTION: COMMENTS S FINER BY WEIGHT

# RB 29-2 150-160

#### HYDROMETER ANALYSIS

FILE NO: SAMPLE NO:	
DATE:	
BY:	

a.s.t.m. D422-63

			A.S.T.	III. D	422-6	<u> </u>				
3TA0	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	℃ TEMP.	RH= CMCd	METER		K	N (%)	Z ₁ (%)
		1/2	31		3/3	0.059	11.1	.opc	62.6	
		/	28		283	0.043	11.5	1,	56.6	
		v	27.5		27.8	0.030	11.6	′/	55.6	
		3	26	27.6	26.3	0.025	11.9	"	52.6	
		14	21	_	21.3	0.012	12.7	",	42.6	
		30	17.5	/	17.8	0.0083	13,2	"	35.6	
		72	12.5	W	12.9	0.0055	14.1	.0124	25.8	
		340	7.0	26	6.6	0.0027	15.0	10127	13.2	
		1295	3.0	28	3.4	00014	15.6	.0124	6.8	
	}									
					ļ					

DESCRIPTION:
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
MENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE :
$N=R\frac{G}{G-1}\times\frac{100}{Us}=R$
REMARKS:

PB 21-2 150-101

FILE NO:______
SAMPLE NO:_____
DATE:_____

- SIEVE ANALYSIS -

:3TAC	
BY:	

SIEVE	UEIGHT	PERCENT		VE PERCENT
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				
NO. 10	0			* ( ) ~
NO.20	1.5	3 0		7,7
NO.40	2.5	<u></u>		22
NO.60				
NO.100	2.5			7,5
NO.140				
NO.200	4 4	f f		16.5
PAN	<u> 33. /</u>	K 5 . 2		
TOTAL		136.6		<u> </u>
REMARKS				

FILE NO: RB 29-3 SAMPLE NO: GRAIN SIZE CHART 180-185 COARSE 0001 CLAY FINE 0.005 MEDIUM 001 GRAVEL SAND CLAY PILT COARSE 0.05 Nº 200 140 | -GRAIN SIZE (MM)-PINE N.40 N.60 | N.100 MEDICAL SAND SIZES - SIEVE COARSE N. 10 FINE GRAVEL **MEDICA** DE SCRIPTION: COMMENTS % FINER BY WEIGHT

## PB 29-3 180-185 HYDROMETER ANALYSIS

FILE NO:
SAMPLE NO:
DATE:
BY:

#### AST.M. D422-63.

3TAD 19	ACTUAL TIME	ELAPSE TIME (MIN)	R _H	T <i>E</i> MP. ℃	R + 1= (Corcd)	DIA- METER (m m).		K	N (%)_	Z, (%)
		1/2	17.5		175	0.065	13,2	.0126	350	
			<b>L'3</b>		12.2	0.046	13.6	4	31.0	
		γ	14.0		14.0	2033	13.8	4	28.0	
		3	12.5	27	125	0.027	13.9	4	25.0	
		14	10		10.0	0.013	14.5	4	20.0	
		34	9	1	9.0	a83	14.7	4	18.0	
		80	6	28	6.4	0.0054	15,2	,0/24	12.8	
		240	4	76.5	3,8	00032	15.5	, 6137	7.6	
		480	35	25	2,6	0,0023	15.5	,0129	5.2	
		1140		27	1	0.0015	16.0	1016	2	

DESCRIPTION
SPECIFIC GRAVITY; Gs: ASSUMED =; CALCULATED =
TIENISCUS CORRECTION, Cm:
DISPERSING AGENT CORRECTION, Cd:
DRY WEIGHT OF SOIL, Us:
% < Nº60 SIEVE:
% < Nº60 SIEVE : N1=(% < Nº60) N=N (COMBINED ANALYSIS).
$N = R \frac{G}{G-1} \times \frac{100}{US} = R \underline{\hspace{1cm}}$
REMARKS:

FB 21.3 30 - 35

FILE NO:	
SAMPLE NO:_	
DATE:	
BY:	

-SIEVE ANALYSIS -

SIEVE	UEIGHT	PERCENT	CUMULATIVE PERCENT	
SIZE	RETAINED, g.	RETAINED	RETAINED	PASSING
3 IN.				
21/2 IN.				
2 IN.				
1 1/2 IN.				
1 IN.				
3/4 IN.				
1/2 IN.				
3/8 IN.				
NO. 4				100.0
NO. 10	1			£7 3
NO. 20	1.3	2 -		
NO.40	5.1	/ :		777 =
NO.60				
NO.100	10.3	24.5		6 5
NO.140			<u> </u>	
NO.200	4-5	9. 0		526
PAN	24.3	2.2.4	<u> </u>	<u> </u>
TOTAL			<u> </u>	
REMARKS				



APPENDIX 5-E

Results of Laboratory Analyses of Water Samples

RECEIVED: 09/06/84 PAGE

Serv REPORT 09/26/84 11:44:34 Analytical Serv

LAB # 84-09-033

PREPARED <u>Radian Analytical Services</u> BY <u>8501 MoPac Blvd.</u> Austin, Texas 78766 (512) 454-4797 P. O. Box 9948 ATTEN or Sacramento Wayne Pearce Austin REPORT Radian B 1 ATTEN

CERTIFIED BY

CONTACT CONOVER

SAMPLES

MCCLELLAN AF McClellan AFB

CLIENT COMPANY FACILITY

please send one copy of the report to Toby Walters in Austin

WORK ID Reconn Boring TRANS hand carried 212-027-16 TAKEN 9/5/84 H20 TYPE

* Indicates a value less than 5 times the detection limit which must be interpreted accordingly

specific matrix was not within acceptable limits indicating @ Indicates that spike recovery for this analysis on the an interferent present

> SAMPLE IDENTIFICATION RB-1-1, 120 RB-1-2, 140 RB-1-3, 160 김영영

under separate cover

INVOICE

Analytical Serv TEST CODES and NAMES used on this report

EPA Method 601/GC Calcium, ICPES Bicarbonate Chloride IC ron, ICPES Carbonate HCO3 A GC 601 C03 A FEE

Sodium, ICPES Sulfate IC MG E NA E SO4 IC

Magnesium, ICPES

LAB # 84-09-033										
REPORT TEST	RB-1-3	Sample 03	34	<u>æ</u>	•	74	78	35	53	33
ical Serv REPORT REPORT RESULTS BY TEST	RR-1-2	Sample 02	1	53	D	44	79	23	21	ന ന്
Analytical	RB-1-1	Sample 01 (entered units)	35	16	Ü	5.9	76	됩	30	114
PAGE 2 RECEIVED: 09/06/84		TEST CODE	CA_E		i				N S	S04 IC

RECEIVED: 09/06/84

Analytical Serv REPORI Results by Sample

LAB # 84-09-033

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/05/84 SAMPLE 1D RB-1-1, 120

Category

NAME EPA Method 601/GC

된

VERIFIED BY COMPOUNDS DETECTED

786

DATE INJECTED 09/24/84 V| DATA FILE

ANALYST INSTRUMENT

SCAN

2

Chloromethane

욷

Bromomethane

일

Vinyl Chloride

2

Chloroethane

RESULT

Trichloroethene COMPOUND

0.5

2

2

1, 1, 2-Trichloroethane

Dibromochloromethane

욷 cis-1, 3-Dichloropropene

2 2-Chloroethylvinyl Ether

2 Bromoform

3 1, 1, 2, 2-Tetrachloroethane

밀 Tetrachloroethylene

밀 Chlorobenzene

윋 1, 3-Dichlorobenzene

뮏 1, 2-Dichlorobenzene

2 1, 4-Dichlorobenzene

> 밁 1, 1, 1-Trichloroethane

일 일 Carbon Tetrachloride

1, 2-Dichloropropane

밁

2

80.3 Methylene Chloride

Trichlorofluoromethane

0.8

1, 1-Dichloroethene

5

1, 1-Dichloroethane

S

trans-1, 2-Dichloroethene

밁

Chloroform

밁

1, 2-Dichloroethane

밁

Bromodichloromethane

3

trans-1, 3-Dichloropropene

COMPOUND

SCAN

RESULT

RECEIVED: 09/06/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-09-033 Continued From Above

SAMPLE ID RB-1-1, 120

FRACTION OIC TEST CODE GC 601
Date & Time Collected 09/05/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified SCAN = scan number or retention time on chromatogram. All results reported in  $uq/\underline{L}$  unless otherwise spec

RECEIVED: 09/06/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-09-033

1.

SAMPLE ID RB-1-2, 140

FRACTION 02C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 09/05/84

Category

SS 0

RESULT VERIFIED BY COMPOUNDS DETECTED COMPOUND 및 ANALYST INSTRUMENT SCAN DATE INJECTED 09/24/84 RESULT COMPOUND DATA FILE SCAN CONC

2 Chloromethane

Bromomethane

2 뮏

Chloroethane Vinyl Chloride

뮏

Methylene Chloride

밁

밁

Trichlorofluoromethane

1, 1-Dichloroethene

밁

1, 1-Dichloroethane

밁

trans-1, 2-Dichloroethene

2

Chloroform

밁

2 1,2-Dichloroethane

1, 1, 1-Trichloroethane

밁

밁 Carbon Tetrachloride

Bromodichloromethane

밁

밁 1,2-Dichloropropane 밁 trans-1,3-Dichleropropene

g Trichloroethene 밀

Dibromoch loromethane

웆 1, 1, 2-Trichloroethane

cis-1, 3-Dichloropropene

밀

S 2-Chloroethylvinyl Ether 2

Bromoform

2 욷 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene**  9 Chlorobenzene

밁 1, 3-Dichlorobenzene

2 1, 2-Dichlorobenzene 2 1, 4-Dichlorobenzene

PAGE 6 RECEIVED: 09/06/84

REPORT Results by Sample Analytical Serv

LAB # 84-09-033 Continued From Above

SAMPLE ID RB-1-2, 140

FRACTION O2C TEST CODE GC 601 Date & Time Collected 09/05/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. unless otherwise specified. SCAN = scan number or retention time on chromatogram. 1/bn All results reported in__

PAGE 7 RECEIVED: 09/06/84

Analytical Serv Results by Sample

LAB # 84-09-033

DATA FILE A CONC. FACTOR SCAN	COMPOUND Chloromethane Chloromethane ND Chloroethane Chloroethane Chloroethane Chloroethane Chloroethane I, 1-Dichloroethane ND I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane I, 1-Dichloroethane II, 1-Dichloroethane	Ilected 09/05/8 ANALYST INSTRUMENT SCAN	BY J
trans- 1,1 ——————————————————————————————————	trans-1,2-Dichloroethene ND  1,2-Dichloroethane ND  1,1,1-Trichloroethane ND  Carbon Tetrachloride ND  Bromodichloromethane ND  1,2-Dichloropropane ND  trans-1,3-Dichloropropene ND		Chlorobenzene ND  1,3-Dichlorobenzene ND  1,4-Dichlorobenzene ND  1,4-Dichlorobenzene ND

PAGE 8 RECEIVED: 09/06/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-09-033 Continued From Above

SAMPLE ID RB-1-3, 160

FRACTION 03C TEST CODE GC 601 Date & Time Collected 09/05/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

SCAN = scan number or retention time on chromatogram.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute.

PAGE 9 RECEIVED: 09/06/84

Analytical Serv REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

LAB # 84-09-033

DUP 601 DUP 601 DUP 601 01D 02D 03D

PAGE 1 RECEIVED: 09/07/84

Analytical Serv REPORT 09/26/84 11:31:01

LAB # 84-09-051

1		1	•
REPORT	REPORT Radian	PREPARED	PREPARED Radian Analyt
10	TO B1 4	₽¥	8501 MoPac B
	Austin		P. O. Box 9948
	or Sacramento		Austin, Texas
ATTEN	ATTEN Wayne Pearce	ATTEN	
		PHONE	(512) 454-479
CLIENT	CLIENT MCCLELLAN AF SAMPLES 2		
COMPANY	13		
FACILITY			

- Star Sh	- ZERTIFIED BY	CONTACT CONDVER	
PREPARED Radian Analytical Services BY 8501 MoPac Blvd. P O. Box 9948	Austin, Texas 78766	PHONE (512) 454-4797	

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* Indicates a value less than 5 times the detection limi	5 times the detection limit
which must be interpreted accordingly.	.ordinglu.
— @ Indicates that spike recovery for this analy	for this analysis on the
specific matrix was not within acceptable limit	in acceptable limits indicating
an interferent present.	

DENTIFICATION		
ES	180	200
SAMPLE	R3-1-4,	RB-1-5,
	01	05

under separate cover

INVOICE

212-027-16

H20

TRANS TYPE P. O. #

Reconn Boring

9/6/84

WORK ID

hand carried

Analytical Serv TEST CODES and NAMES used on this report Iron, ICPES EPA Method 601/GC Magnesium, ICPES Calcium, ICPES Sodium, ICPES Sulfate IC Bicarbonate Chloride IC Carbonate 9C 601 HCD3 A MG E CA E CO IC CO A FE E NA E SO4 IC

رد عام د عام	**************************************		DCCCOT	1 A D # 0 A O C A C. A	
rage 2 RECEIVED: 09/07/84	Anaigtica	tical serv RESULTS BY TEST	REPURI TEST	LAB # 84-07-031	
	78-1-4	88-1-5			ļ
TEST CODE :	Sample 01 (entered units)	Sample 02 (entered units)			
CAE	15	ł			
	4	53			
	J	₽			
שלי שב השנחש . ייי	6. 1				
#C03_A	93	487			
E de cacos	12	걸			
E W	17	14			
		•••			
. 7/5w					

RECEIVED: 09/07/84

SAMPLE ID RB-1-4, 180

REPORT Analytical Serv

LAB # 84-09-051

NAME EPA Method 601/GC

Results by Sample

FRACTION O1C TEST CODE GC 601

900 COMPOUNDS DETECTED VERIFIED BY Category χ Ω Date & Time Collected 09/06/84 ANALYST INSTRUMENT DATE INJECTED 09/11/84 DATA FILE CONC. FACTOR

RESULT Trichloroethene COMPOUND SCAN 2 RESULT Chloromethane COMPOUND SCAN

2 S 2 Bromomethane Vinyl Chloride Chloroethane

2 밁 Methylene Chloride Trichlorofluoromethane

2 1, 1-Dichloroethene

1, 1-Dichloroethane

S

9 trans-1, 2-Dichloroethene

2 Chloroform

1, 2-Dichloroethane

밁

밀 1, 1, 1-Trichloroethane Carbon Tetrachloride

밁

2 **Bromodichloromethane**  밁 1, 2-Dichloropropane S

trans-1, 3-Dichloropropene

Dibromoch loromethane 1, 1, 2-Trichloroethane

2

S

2

밁 cis-1, 3-Dichloropropene

2 2-Chloroethylvinyl Ether 2

Bromoform

밁 S 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 2 Chlorobenzene

2 1, 3-Dichlorobenzene S 1, 2-Dichlorobenzene g

1, 4-Dichlorobenzene

PAGE 4 RECEIVED: 09/07/84

Analytical Serv Results by Sample

LAB # 84-09-051 Continued From Above

SAMPLE ID RB-1-4, 180

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/06/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 5 RECEIVED: 09/07/84

Analytical Serv Results by Sample

LAB # 84-09-051

1.1

SAMPLE ID RB-1-5, 200

FRACTION 02C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 09/06/84 Category

SON

VERIFIED BY JSG 4DS DETECTED 0	RESULT	ND ac	a *
VERIFIED BY JSG COMPOUNDS DETECTED 0	COMPOUND	Trichloroethene	Dibromochloromethane *
X e	Ü		Dibroa
ANALYST INSTRUMENT	SCAN		
09/11/84	RESULT	QN	QN
INJECTED 09/11/84		omethane	omethane
DATE	COMPOUND	Chlore	Brome
<b>4</b>	•		
DATA FILE	SCAN		

cis-1,3-D	Chloroethane ND	
1,1,2-1	Vinyl Chloride ND	
Dibrom	Bromomethane ND	

1	i	I
QN	Q	ÜN
Methylene Chloride	Trichlorofluoromethane	1,1-Dichloroethene

·	2	 Q
	1,1-Dichloroethane	trans-1, 2-Dichloroethene
		İ

S	CZ
Chloroform	1, 2-Dichloroethane
1	

	 	•
Q	S	
1, 1, 1-Trichloroethane	Carbon Tetrachloride	
ļ		

Q	QN
Bromodichloromethane	1,2-Dichloropropane

밁

trans-1, 3-Dichloropropene

VERIFIED B	COMPOUNDS DETECTE
KS	•

QN
*
1, 1, 2-Trichloroethane

S	Ö
*	Ether
cis-1,3-Dichloropropene	2-Chloroethulvinul E

NE	
#	
1, 1, 2, 2-Tetrachloroethane	

Bromoform

Q	
#	
Tetrachloroethylene	

문

Chlorobenzene

PAGE 6 RECEIVED: 09/07/84

Analytical Serv Results by Sample

LAB # 84-09-051 Continued From Above

SAMPLE ID RB-1-5, 200

FRACTION 02C TEST CODE GC 601 Date & Time Collected 09/06/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{19/L}{L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram.

PAGE 7 RECEIVED: 09/07/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 01D 02D

Analytical Serv REPORT NonReported Work

LAB # 84-09-051

CLASSING CANA

LAB # 84-08-159

REPORT

Analytical Serv

CONTACT CONOVER CERTIFIED BY PREPARED <u>Radian Analutical Services</u> BV 8501 MoPac Blvd. Austin, Texas 78766 (512) 454-4797 P. O. Box 9948 08/30/84 16:21:48 ATTEN SAMPLES under separate cover COMPANY McClellan AFB FACILITY or Sacramento WORK ID Recon, Boring hand carried ATTEN WAYNE PEATOR CLIENT MCCLELLAN AF 212-027-16 PAGE 1 RECEIVED: 08/15/84 8/14/84 Austin REPORT Radian ᄗ TYPE INVOICE ᄗ TRANS TAKEN

Analytical Serv TEST CODES and NAMES used on this report

EPA Method 601/GC

GC 601 FE E

Iron, ICPES

Carbonate

C03 A

Chloride IC

Calcium,

SAMPLE IDENTIFICATION

RB-2-2, 135-140 RB-2-3, 155-160

의임임3

RB-2-1, 95-100

RB-2-4, 175-180

Magnesium, ICPES Sodium, ICPES

Sulfate IC

NA E 504 IC

Bicarbonate

HCO3 A

# MWHONTE

PAGE 2 RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159

18 CL_IC 20 CO3 A <1 FE_E 1.2 H			RIFLE 10 ND-E-11 73-100		Date (	A Time	Date & Time Collected 08/14/84	08/14/8	7 4	Category	
	CA E	18	CL_IC	20	C03_A	1>	m'	1.2	HCO3_A_	CO3_A96_MG_E_	E
7 JI 7US CC 3 MA F	NA FI	CC CC	JI 7U5	7 /s				1 1 1 1 1			



RECEIVED: 08/15/84 PAGE 3

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-159

51

NAME EPA Method 601/GC FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/14/84 SAMPLE ID RB-2-1, 95-100

COMPOUNDS DETECTED VERIFIED BY Category ACL B ANALYST INSTRUMENT DATE INJECTED 08/23/84 8 DATA FILE CONC. FACTOR

COMPOUND

RESULT

980

Trichloroethene

S

Dibromoch loromethane

1, 1, 2-Trichloroethane

2

SCAN S RESULT Chloromethane COMPOUND SCAN

S Bromomethane

2 Vinyl Chloride

S Chloroethane

Methylene Chloride

2

2

밀

S

**Trichlorofluoromethane** 1, 1-Dichloroethene

1, 1-Dichloroethane

trans-1, 2-Dichloroethene

밁

Chloroform 1,2-Dichloroethane

뮏

S

1, 1, 1-Trichloroethane

밁 Carbon Tetrachloride

2 일 Bromodichloromethane 1, 2-Dichloropropane S trans-1, 3-Dichloropropene

윋 Chlorobenzene

2

Bromoform

윋

2-Chloroethylvinyl Ether

cis-1, 3-Dichloropropene

Q

1, 1, 2, 2-Tetrachloroethane

2

Tetrachloroethylene

2 1, 3-Dichlorobenzene 2 1, 2-Dichlorobenzene

2 1, 4-Dichlorobenzene

#### CZ SONAW CORPORATION

RECEIVED: 08/15/84 PAGE 4

Results by Sample Analytical Serv

REPORT

LAB # 84-08-159 Continued From Above

SAMPLE ID RB-2-1, 95-100

FRACTION OIC TEST CODE GC 601
Date & Time Collected 08/14/84

NAME EPA Method 601/GC

Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{ug/L}{L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

LZ AZ KOLANIA

PAGE 5 RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159

SAMPLE ID	RB-2-2	SAMPLE ID RB-2-2, 135-140		SAMPLE	# 05	SAMPLE # 02 FRACTIONS: A, B, C, D	A, B, C,	Q		
					Time	Collected <u>(</u>	38/14/84		Category	
CA E	21	21 CL IC	21	CO3 A <1	$\Box$	THE THE	6.7	HCD3 A	6.7 HCO3 A 96 MG E	C
	ug/m]			Se 7/6w	<b>a</b> C03		ug/ml	mg/L as	Cacoa	ug/m1
A E	22	S04 IC	9							
	ug/ml		mg/L							

# 

RECEIVED: 08/15/84

Analytical Serv

REPORT Results by Sample

LAB # 84-08-159

57

1.6

SAMPLE ID RB-2-2, 135-140

NAME EPA Method 601/GC Category FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/14/84

ACL B ANALYST INSTRUMENT DATE INJECTED 08/23/84 8

920 VERIFIED BY COMPOUNDS DETECTED DATA FILE

RESULT Trichloroethene Dibromochloromethane COMPOUND SCAN 윋 RESULT Chloromethane COMPOUND SCAN

2

2

뫼

1, 1, 2-Trichloroethane

cis-1, 3-Dichloropropene

S

밁 2 Bromomethane Vinyl Chloride

2 呈 Chloroethane

Methylene Chloride Trichlorofluoromethane

윋

윋

뮏

Bromoform

뮏

2-Chloroethylvinyl Ether

S

Tetrachloroethylene

1, 1, 2, 2-Tetrachloroethane

윋

뮏

1, 3-Dichlorobenzene

밀

1, 2-Dichlorobenzene

뮏

Chlorobenzene

1, 1-Dichloroethene

윋 1, 1-Dichloroethane 뮏 윋 Chloroform trans-1, 2-Dichloroethene

밁 1, 2-Dichloroethane

뮏 1, 1, 1-Trichloroethane

뮏 윋 Carbon Tetrachloride Bromodichloromethane

밁 1, 2-Dichloropropane 2

trans-1, 3-Dichloropropene

1, 4-Dichlorabenzene

윋

#### NA MI TON CO CO

RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159 Continued From Above

1

SAMPLE ID RB-2-2, 135-140

FRACTION 02C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/14/84 Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{100/L}{100}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 8 RECEIVED: 08/15/84

LAB # 84-08-159

Analytical Serv REPORT Results by Sample

SAMPLE 10 KB-2-3, 155-160  SA E 20 CL IC 18  NA E 25 COA IC 4
18 CO3 PM PM PM PM PM PM PM PM PM PM PM PM PM
18 CO3 mg/L 6
20 CL_IC
20 20 25 25 25

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LAB # 84-08-159

REPORT

Analytical Serv

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RESULT

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VERIFIED BY COMPOUNDS DETECTED Trichlorosthene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane Category COMPOUND MCL TEST CODE GC 601 FRACTION O3C TEST CODE GC 60
Date & Time Collected 08/14/84 ANALYST INSTRUMENT SCAN Results by Sample DATE INJECTED 08/23/84 2 윋 문 욷 윋 月 뮏 2 뮏 일 2 S 윋 Q 밀 S RESULT Chloroform Chloromethane **Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane trans-1,3-Dichloropropene Trichlorofluoromethane 1, 1-Dichloroethene 1, 2-Dichloroethane Carbon Tetrachloride **Bromodichloromethane** 1,2-Dichloropropane COMPOUND SAMPLE ID <u>RB-2-3, 155-160</u> 2 RECEIVED: 08/15/84 DATA FILE CONC. FACTOR SCAN

#### KX MA DO MA

PAGE 10 RECEIVED: 08/15/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-159 Continued From Above

SAMPLE ID RB-2-3, 155-160

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/14/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\log L}{\log n}$  unless otherwise specified. ND  $^{\circ}$  not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

# NY TOP DON NO.

PAGE 11 RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159

	9.5 ug/m1	
0rg	MGE	
Category	84 cac03	
0.4	0.90 HC03 A 84 MG E	
IS: A, B, C 08/14/8	1	
SAMPLE # 04 FRACTIONS: A, B, C, D Date & Time Collected 08/14/84	CO3 A <1 FE E	
LE # 04	(1) s cac03	
SAME	CO3 A	
	18 mg/L	7/6w
175-180	CL_1C	S04_IC
AMPLE ID RB-2-4, 175-180	15	22 ug/m1
SAMPLE	CA_E	NA_E

## K. K. Lind B. D. Lind B. M.

PAGE 12 RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159

GC 601 NAME EPA Method 601/GC 4/84 Category	YST MCL VERIFIED BY JSG	COMPOUND	Trichloroethene ND	Dibromochloromethane * ND	1, 1, 2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1,1,2,2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1,3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1,4-Dichlorobenzene ND				
TION 04C TEST CODE GC 601 & Time Collected 08/14/84	ANALYST INSTRUMENT	SCAN	ļ															
FRACTION 04C Date & Time Col	DATE INJECTED 08/23/84	COMPOUND RESULT	Chloromethane ND	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chlaride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1, 1-Dichloroethane ND	trans-1, 2-Dichloroethene ND	Chloroform ND	1, 2-Dichloroethane ND	1, 1, 1-Trichloroethane ND	Carbo Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	Dichloropropene ND :
SAMPLE ID RB-2-4, 175-180	LE B						Aet	Trichlo	# *#	1.1	trans-1, 2		4.1	1, 1, 1-	Carbo	Bromo	1,2-	trans-1,3-Dichlorop
SAMPLE ID	DATA FILE CONC. FACTOR	SCAN							İ									

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PAGE 13 RECEIVED: 08/15/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-159 Continued From Above

SAMPLE ID RB-2-4, 175-180

?-4, 175-180

FRACTION 04C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/14/84 Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\log L}{L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2—tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

#### CONT. CHANGE

PAGE 14 RECEIVED: 08/15/84

Analytical Serv REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

LAB # 84-08-159

#### EX LE EDU AN EL

LAB # 84-08-194

Serv REPORT 08/30/84 16:34:57

Analytical Serv

RECEIVED: 08/21/84

PAGE 1

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please send one copy of the report to Toby Walters in Austin CONTACT CONDVER CERTIFIED BY PREPARED Radian Analytical Services Austin, Texas 78766 8501 MoPac Blvd (512) 454-4797 Box 9948 ص 0 B≺ PHONE ATTEN SAMPLES P.O. # 212-027-16 INVDICE under separate cover COMPANY McClellan AFB or Sacramento WORK ID Reconn Boring Wayne Pearce CLIENT MCCLELLAN AF 212-027-16 8/20/84 REPORT Radian Austin hand TYPE H20 TAKEN TRANS ATTEN FACILITY

Analytical Serv TEST CODES and NAMES used on this report

ICPES

Calcium,

CA E

SAMPLE IDENTIFICATION

RB-3-2, 155-160

의임임

RB-3-1, 95-100

175-180

RB-3-3,

Chloride IC

EPA Method 601/GC

Iron, ICPES

Carbonate

CO3 A FE E Magnesium, ICPES

Bicarbonate

GC 601 HC03 A Sodium, ICPES

Sulfate IC

NA E SO4 IC

MG

### KY AND IN AND CONCORDINATION

PAGE 2 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194

SAMPLE 1	U KB-3-1	AMPLE 10 RB-3-1, 95-100		SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/20/84		FRACTIONS	A, B, C, 08/20/8	4 D	Category	DT.	
CA E	16	CL_IC	8	CO3 A <1 FE E 0,010		FE		HC03 A 95 MG E	95	35 E	==
			mg/L	mg/L as CaC	03			mg/L as	. CaC03	 	ug/ml
NA E	26	S04 IC	15								
	ug/m1		J/Bw								

RECEIVED: 08/21/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-194

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/20/84 SAMPLE ID RB-3-1, 95-100

**980** 뮏 2 뮏 윋 일 뮏 윋 2 RESULT VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromach loromethane 1, 1, 2-Trichloroethane 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene cis-1, 3-Dichloropropene Category COMPOUND 조동 ANALYST INSTRUMENT SCAN DATE INJECTED 08/23/84 윋 2 S S 뮏 S 뮏 Ž 뮏 뫼 Ω 뮏 Ž 뮏 윋 RESULT Chloromethane Bromomethane Vinyl Chloride Methylene Chloride 1, 1-Dichloroethane Chloroform 1, 2-Dichloroethane 1,2-Dichloropropane trans-1, 3-Dichloropropene Chloroethane Trichlorofluoromethane 1, 1-Dichloroethene trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

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PAGE 4 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194 Continued From Above

SAMPLE ID RB-3-1, 95-100

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/20/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\log L}{\log L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram

#### Construction

PAGE 5 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194

		10			
	Jrg.	MGE			
	Category	104	200		
0		2.3 HC03 A 104 MG E			
S: A, B, C,	Date & Time Collected 08/20/84	C)	TE /50		
FRACTION	Collected	<b>4</b>			
E # 02	k Time		Cacus		
1	Date	CO3_A <1 FE_E	mg/L as		
		13	mg/L	1.3	mg/L
SAMPLE 1D RB-3-2, 155-160		GL_IC_		S04 IC	
D RB-3-2,		14	r@/60	19	ug/ml
SAMPLE		CAE		¥ E	

# EX LA TOTAL

PAGE 6 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194

ī

NAME EPA Method 601/GC Category	KWK VERIFIED BY JSG COMPOUNDS DETECTED 0	COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1, 1, 2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform	1, 1, 2, 2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene	1, 3-Dichlorobenzene ND	1, 2-Dichlorobenzene ND	1, 4-Dichlorobenzene ND				
FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/20/84	ANALYSTINSTRUMENT	SCAN							1,									
FRACTION O2C Date & Time Col	DATE INJECTED 08/23/84	RESULT	Chloromethane ND :	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Chloride ND	romethane ND	oroethene ND	proethane ND 1	proethene ND 1	Chloroform ND	oroethane ND	oroethane ND	achloride ND I	romethane ND	ropropane ND	ropropene ND
2, 155-160	A DATE	COMPOUND	Ch 1 o	Bro	Vinyl	Chl	Methylene	Trichlorofluoromethane	1, 1-Dichlor	1,1-Dichloroethane	trans-1,2-Dichloroethene	ū	1,2-Dichloroethane	1, 1, 1-Trichloroethane	Carbon Tetrachloride	Bromodichloromethane	1,2-Dichlorop	trans-1,3-Dichloropropene
SAMPLE ID RB-3-2, 155-160	DATA FILE CONC. FACTOR	SCAN																

### COMPUNETION

PAGE 7 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194 Continued From Above

> RECEIVED. 00/21/04 SAMPLE ID <u>RB-3-2, 155-160</u>

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/20/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

#### Construction and Market

PAGE 8 RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

SAMPLE I	D RB-3-5	SAMPLE ID <u>RB-3-3, 175-180</u>		SAMPLE Date 8	- Tage   33	SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 08/20/84	IS: A, B, C, 08/20/8		Category	ıry	
CA_E	26	CL_IC	13	CO3 A <1 FE E	~	m m	73	73 HCD3 A 84 MG E	84	MG	26
	ug/m1		mg/L	mg/L as	CaCO3		ug/ml	mg/L as	CaC03	i	ug/m]
NA E	24	S04 IC	1.6								
	ug/ml		mg/L								

# LY EN WORKEN

RECEIVED: 08/21/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-194

980 RESULT VERIFIED BY COMPOUNDS DETECTED NAME EPA Method 601/GC Category COMPOUND X A FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/20/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/23/84 뮏 RESULT Chloromethane COMPOUND SAMPLE ID RB-3-3, 175-180 DATA FILE CONC. FACTOR SCAN

Trichloroethene

S

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2

Tetrachloroethylene

뮏

밁

Chlorobenzene

2

1, 3-Dichlorobenzene

뮏

1,2-Dichlorobenzene

Bromoform 2-Chloroethylvinyl Ether Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 뮏 뮏 2 S Vinyl Chloride Methylene Chloride Bromomethane Chloroethane

1, 1, 2, 2-Tetrachloroethane 뮏 2 **Trichlorofluoromethane** 1, 1-Dichloroethene

윋 trans-1, 2-Dichloroethene

1, 1-Dichloroethane

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윋 皇 Chloroform 1, 2-Dichloroethane

윋 1, 1, 1-Trichloroethane

밁

Carbon Tetrachloride

뮏 Bromodichloromethane

뒫 1,2-Dichloropropane

trans-1, 3-Dichloropropene

윋

1, 4-Dichlorobenzene

#### CALL STATES

PAGE 10 RECEIVED: 08/21/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-194 Continued From Above

1.

SAMPLE 1D RB-3-3, 175-180

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/20/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79).

#1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute.

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PAGE 11 RECEIVED: 08/21/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

Analytical Serv REPORT NonReported Work

#### L. C. Lind Cold Ball Ball

PAGE 1 RECEIVED: 08/14/84

Analytical Serv REPORT 09/05/84 09:51:14

LAB # 84-08-134

PREP.				∢ :
Radian	B1 4	Austin	or Sacramento	Wayne Pearce
REPORT	10			ATTEN

Radian Analytical Services	8501 MoPac Blvd.	0. Box 9948	Austin, Texas 78766		(512) 454-4797
S B	85	ο.	A		5
REPARED	BY			ATTEN	PHONE

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X Charles	CERTIFIED

CONTACT CONDVER

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SAMPLES

McClellan AFB

COMPANY

FACILITY

MCCLELLAN AF

WORK ID Recon. Boring

TAKEN 8/13/84

please send one copy of the report to Toby Walters in Austin second column confirmation performed on split 4C Note:

Analyt	SAMPLE IDENTIFICATION	
	INVOICE under separate cover	
	P 0. # 212-027-16	
	TYPE H20	
	TRANS hand carried	

105-110 135-140 155-160

RB-4-1, RB-4-2, 195-200

RB-4-3, RB-4-4,

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4	
5	
used	
NAMES	
and	
Analytical Serv TEST CODES and NAMES used on	Chloride IC Carbonate Iron, ICPES EPA Method 601/GC Bicarbonate Magnesium, ICPES Sodium, ICPES
Analyt	CL IC CO3 A FE E GC 601 HCO3 A MG E NA E SD4 IC

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is report

## COMPONENTION

PAGE 3 RECEIVED: 08/14/84

Analytical Serv REPURT Results by Sample

	21 ug/m1	
Category	43 MG E	
	2.0 HC03 A 143 MG E	
SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/13/84		
LE # 01 FR/ & Time Coll	003 A <1 FE E	
SAMP		
	29 mg/L	9 9
, 105-11(	0T ⁻ 10	S04_IC_
SAMPLE ID RB-4-1, 105-110	27	28
SAMPLE	CA_E	NA_E

### CORPCIATION

PAGE 4 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-134

[ 1

SAMPLE ID RB-4-1, 105-110

NAME EPA Method 601/GC TEST CODE GC 601 Date & Time Collected 08/13/84 FRACTION 01C

JSG 4 물 2 Q 밁 밁 밁 2 RESULT 물 S 밁 S 0.1 COMPOUNDS DETECTED VERIFIED BY Trichloroethene 1,4-Dichlorobenzene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Tetrachloroethylene Category COMPOUND MCL ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 밁 S Ž 呈 0.6 밁 윋 밁 2 딝 S 9 RESULT 뮏 0.1 Chloromethane Bromomethane Vinyl Chloride Trichlorofluoromethane 1, 1-Dichloroethane Chloroform trans-1,3-Dichloropropene Chloroethane Methylene Chloride 1, 1-Dichloroethene trans-1, 2-Dichloroethene 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane COMPOUND DATA FILE NC. FACTOR SCAN CONC

CORPURATION

PAGE 5 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-134 Continued From Above

SAMPLE ID RB-4-1, 105-110

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/13/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

# Consumment of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the best of the

PAGE 6 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

2, 135-140	

		13	ug/m]		
	Category	92 MG E	cac03		
0''	34	0.13 HC03 A 92	mg/Las (		
VS: A, B, (	1 08/13/6	0.13	ug/m]		
SAMPLE # 02 FRACTIONS: A, B, C, D	Collected				
LE # 02	& Time	13_A_<\(1)	s CaCO3		
SAMP	Date	C03_A	mg/L a		
		21	mg/L	7.9	mg/L
135-140		CL_IC		S04 IC	ı
SAMPLE ID RB-4-2, 135-140		18	ng/mJ	26	1m/6n
SAMPLE		CA E		NA E	

RECEIVED: 08/14/84

Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-134

SAMPLE ID RB-4-2, 135-140

NAME EPA Method 601/60 Category TEST CODE GC 601 FRACTION O2C TEST CODE GC 6C Bote & Time Collected 08/13/84

**JSG** RESULT COMPOUNDS DETECTED VERIFIED BY MCL ANALYST INSTRUMENT DATE INJECTED 08/27/84 4 DATA FILE CONC FACTOR

COMPOUND SCAN RESULT

Trichloroethene

S

2

Ž 1, 1, 2-Trichloroethane

Dibromochloromethane

5

Bromomethane

Ž

Vinyl Chloride

g

Chloroethane

S

Methylene Chloride

N

Chloromethane

COMPOUND

SCAN

S cis-1, 3-Dichloropropene

QN 2-Chloroethylvinyl Ether

S Bromoform

0

Trichlorofluoromethane

Q Z

1, 1-Dichloroethene

S

trans-1, 2-Dichloroethene

2

1, 1-Dichloroethane

S

Chloroform

S

1, 2-Dichloroethane

1, 1, 2, 2-Tetrachloroethane

S

Ž Tetrachloroethylene

Ž 1, 3-Dichlorobenzene

2

Chlorobenzene

Ž 1, 2-Dichlorobenzene 일 1, 4-Dichlorobenzene

밁 1, 1, 1-Trichloroethane

S Carbon Tetrachloride Bromodichloromethane

QN

2 1, 2-Dichlaropropane trans-1, 3-Dichloropropene

L.Z.L.L.D.B.Z.B.Z.

PAGE 8 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-134 Continued From Above

SAMPLE ID RB-4-2, 135-140

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/13/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute 12/3/79) ND = not detected at EPA detection limit method 601, (Federal Register, #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

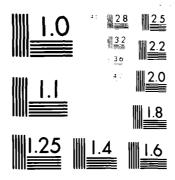
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PAGE 9 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

SAMPLE II	RB-4-3	SAMPLE 1D RB-4-3, 155-160		SAMPLE Date &	# 03	SAMPLE # 03 FRACTIONS: A,B,C,D Date & Time Collected 08/13/84	S. A, B, C 08/13/8	4	Category	ก็แ	
CA_E	20	20 CL_IC	21 mg/L	CO3 A <1 FE E	(1 CaCO3	HE E		5. 6 HCO3 A 95 MG E	95	É E	14 ug/m1
NA E	23	504_10	7.7								
	ug/ml		mg/L								

INSTALLATION RESTORATION PROGRAM PHASE II (STAGE 2-1)
VOLUME 2(U) RADIAN CORP AUSTIN TX R N BAUER NAY 85
F33615-83-D-4001 AD-A156 283 07/10 UNCLASSIFIED F/G 13/2 NL



MICROCOPY RESOLUTION TEST CHART

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Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-134

NAME EPA Method 601/GC FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/13/84 SAMPLE ID RB-4-3, 155-160

500 윋 S 밁 일 RESULT 밁 2 S 2 9 S 2 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 2 윋 S 밀 윋 2 윋 윋 윋 밁 밁 밁 일 밁 윋 밀 RESULT Chloromethane **Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride 1, 1-Dichloroethane Chloroform Bromodichloromethane 1, 2-Dichloropropane trans-1, 3-Dichloropropene Trichlorofluoromethane 1, 1-Dichloroethene trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride COMPOUND DATA FILE CONC. FACTOR SCAN

CORPORATION

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Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-134 Continued From Above

NAME EPA Method 601/GC Category

SAMPLE ID RB-4-3, 155-160

FRACTION O3C TEST CODE GC 601 Date & Time Collected 08/13/84

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

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PAGE 12 RECEIVED: 08/14/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-134

SAMPLE # 04 FRACTIONS: A, B, C, D Date & Time Collected OR/13/84 Category	4.0 HC03 A	Tares as cared
04 FRACTI	34 FE_E	
SAMPLE # 04	CO3_A 34 FE_E	
	24 CO	
195-200	כר וכ	S04_IC_
AMPLE ID RB-4-4, 195-200	24 CL_IC	26
SAMPLE	CA E	NE

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RECEIVED: 08/14/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-134

SAMPLE ID RB-4-4, 195-200

NAME EPA Method 601/GC Category FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/13/84

980 밁 2 윋 일 2 2 밁 RESULT 2 2 밁 Q 뫼 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 1,4-Dichlorobenzene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene COMPOUND MCL ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 일 S 일 2 밁 일 밁 일 일 9 일 윋 윋 밁 RESULT 일 윋 Chloromethane Bromomethane Chloroform trans-1,3-Dichloropropene Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1,1-Dichloroethane trans-1, 2-Dichloroethene 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride **Bromodichloromethane** 1, 2-Dichloropropane COMPOUND DATA FILE CONC. FACTOR SCAN

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Analytical Serv REPORT Results by Sample

LAB # 84-08-134 Continued From Above

SAMPLE ID RB-4-4, 195-200

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/13/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{uq/L}{L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2—tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 15 RECEIVED: 08/14/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

Serv REPORT NonReported Work Analytical Serv

## KADIAN CORPUGATION

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rv REPORT /22/84 13: 56: 11

LAB # 84-08-129

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SAMPLES

COMPANY MCCIellan AFB

CLIENT MCCLELLAN AF

Recon Boring 8/10/84

WORK ID TAKEN hand carried

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TRANS TYPE

212-027-16

P. O. INS.

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Sun Sun	CERTIFIED BY	CONTACT CONDVER
PREPARED <u>Radian Analutical Services</u> BY 8501 MoPac Blvd.	Austin, Texas 78766	PHONE (512) 454-4797

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ion performed on 01,02,03. Corrected val-	ezene (01,02) & vinul chloride (02) re-	: of reexamination of data. 1,2- & 1,4-	ted here reported as 1.2-dichlorobenzene.
2nd column confirmation	ues for 1, 2-dichlorobeze	ported here as result of	dichlorobenzene coeluted
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SAMPLE IDENTIFICATION RB-5-1, 95-100 RB-5-2, 115-120 RB-5-4, 175-180 RB-5-5, 195-200 135-140 RB-5-3, 리<mark>엉엉엉</mark>엉

Analytical Serv TEST CODES and NAMES used on this report EPA Method 601/GC Magnesium, ICPES Calcium, ICPES Sodium, ICPES Iron, ICPES Bicarbonate Chloride IC Sulfate IC Carbonate MG E NA E SO4 IC HCO3 A GC 601 C03 A

# KADIAN

-129	88-5-5	Sample 05 (entered units)	25	19	29	3.7	110	15	22	18
LAB # 84-08-129	48-5-4	Sample 04 (entered units)	22	18	₽	1.7	92	12	20	7.5
REPORT Test	RB -5-3	Sample 03 (entered units)	38	35	₽	5. CJ	191	30	56	6.7
tical Serv RESULTS BY TEST	88-5-2	Sample 02 (entered units)	330	140	₽	c.i	1045	190	61	290
Analyt	RB-5-1	Sample 01 (entered units)	110	27	₽	0.94	240	78	43	4.1
PAGE 2 RECEIVED: 08/13/84		TEST CODE default units	CA_E			•	HCG3_A	•	NA E	SD4_IC

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Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-129

150 . 3 23.2 2 밁 밁 RESULT 2 2 윋 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene 1, 3-Dichlorobenzene NAME EPA Method 601/GC 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Dibromochloromethane Category COMPOUND RGS FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/10/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/21/84 16.3 밁 밁 586 2 Ž 밁 뮏 2 2 S 517 밀 윋 747 15.9 RESULT Chloroform 1, 2-Dichloroethane 1, 1, 1-Trichloroethane trans-1, 3-Dichloropropene Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene Carbon Tetrachloride **Bromodichloromethane** 1, 2-Dichloropropane COMPOUND SAMPLE ID RB-5-1, 95-100 DATA FILE CONC. FACTOR SCAN

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PAGE 4 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-129 Continued From Above

SAMPLE ID RB-5-1, 95-100

FRACTION O1C TEST CODE GC 601
Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute SCAN ≈ scan number or retention time on chromatogram.

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Serv REPORT Results by Sample Analytica, Serv

LAB # 84-08-129

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SAMPLE ID RB-5-2, 115-120

SCAN

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/10/84

08 C S S 2 皇 밁 윋 RESULT 밁 20.0 COMPOUNDS DETECTED VERIFIED BY Trichloroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1,3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene** Category COMPOUND RGS b ANALYST INSTRUMENT SCAN DATE INJECTED 08/21/84 일 S **686** 2 일 268 330 밁 48. 2 윋 밁 RESULT Chloromethane Vinyl Chloride Chloroform Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1,1-Dichloroethene COMPOUND DATA FILE CONC. FACTOR

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1,4-Dichlorobenzene

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Bromodichloromethane

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Carbon Tetrachloride

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1, 1, 1-Trichloroethane

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1,2-Dichloropropane

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trans-1,3-Dichloropropene

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Analytical Serv REPORT Results by Sample

LAB # 84-08-129 Continued From Above

SAMPLE ID RB-5-2, 115-120

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

RECEIVED: 08/13/84

Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-129

NAME EPA Method 601/GC

SAMPLE ID RB-5-3, 135-140

TEST CODE GC 601 Date & Time Collected 08/10/84 FRACTION 03C

**JSG** (1) (1) 밁 Q S 9 밁 밁 밁 Ω RESULT 밁 COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether 1, 3-Dichlorobenzene Chlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane 1, 1, 2, 2-Tetrachloroethane cis-1, 3-Dichloropropene Tetrachloroethylene Category COMPOUND RGS ANALYST SCAN DATE INJECTED 08/21/84 밁 밁 2 57.0 밁 밁 일 N N 77.6 RESULT 밁 Chloromethane 1,1-Dichloroethane Chloroform Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene trans-1, 2-Dichloroethene COMPOUND **[20]** DATA FILE CONC. FACTOR SCAN

皇

1,2-Dichlorobenzene

S

1, 4-Dichlorobenzene

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1, 1, 1-Trichloroethane

1,2-Dichloroethane

밁

Carbon Tetrachloride

Bromodichloromethane

윌

1, 2-Dichloropropane

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trans-1, 3-Dichloropropene

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PAGE 8 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-129 Continued From Above

SAMPLE 10 RB-5-3, 135-140

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

SCAN = scan number or retention time on chromatogram. All results reported in  $\frac{uq/L}{udles}$  unless otherwise specified. RO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute.

RECEIVED: 08/13/84

Analytical Serv

Serv REPORI Results by Sample

LAB # 84-08-129

NAME EPA Method 601/GC

_	
TEST CODE GC 601	lected 08/10/84
FRACTION 94C	Date & Time Co
SAMPLE ID RB-5-4, 175-180	

8 2 RESULT 밁 밁 2 윋 2 윋 뮏 뫼 밁 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Tetrachloroethylene Dibromochloromethane 1, 1, 2-Trichloroethane 1, 1, 2, 2-Tetrachloroethane cis-1, 3-Dichloropropene Category COMPOUND AC L ANAL YST INSTRUMENT SCAN 7707 207 8 7707 DATE INJECTED 08/22/84 2 S 2 2 呈 일 밀 2 일 밁 윋 0 2 밁 RESULT Chloromethane **Bromomethane** Vinyl Chloride Trichlorofluoromethane 1, 1-Dichloroethane Chloroform 1,2-Dichloroethane Carbon Tetrachloride Chloroethane Methylene Chloride 1, 1-Dichloroethene trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane Bromodichloromethane 1, 2-Dichloropropane COMPOUND DATA FILE CONC. FACTOR SCAN

2

trans-1,3-Dichloropropene

2



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Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-129 Continued From Above

SAMPLE ID RB-5-4, 175-180

FRACTION 04C TEST CODE GC 601
Date & Time Collected 08/10/84

Category

NAME EPA Method 601/GC

NOTES AND DEFINITIONS FOR THIS REPORT.

ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

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PAGE 11 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-129

NAME EPA Method 601/GC

TEST CODE GC 601 Date & Time Collected 08/10/84 FRACTION 05C SAMPLE ID RB-5-5, 195-200

S) SI 뮏 Ż 밀 ᄝ 뮏 밁 S 밁 윌 RESULT 2 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 1, 3-Dichlorobenzene 2-Chloroethylvinyl Ether Chlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene 1, 1, 2-Trichloroethane Dibromoch loromethane 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene cis-1, 3-Dichloropropene Category COMPOUND Σ Σ ANALYST INSTRUMENT SCAN DATE INJECTED 08/22/84 Ž 2 일 2 S Ž 뮏 일 Ω 밁 윋 윋 2 RESULT 0 U Chloromethane Chloroform Vinyl Chloride trans-1, 3-Dichloropropene Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethane 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride 1, 2-Dichloropropane 1, 1-Dichloroethene trans-1, 2-Dichloroethene Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

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Analytical Serv REPORT Results by Sample

LAB # 84-08-129 Continued From Above

SAMPLE ID RB-5-5, 195-200

FRACTION 05C TEST CODE GC 601 Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. All results reported in  $\frac{10.01}{10.01}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2—tetrachloroethane and tetrachloroethylene co-elute. uq/L unless otherwise specified. SCAN = scan number or retention time on chromatogram.

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Serv REPORT NonReported Work Analytical Serv

LAB # 84-08-129

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D 05D



PAGE 1 RECEIVED: 08/10/84

Analytical Serv REPORT 08/28/84 09:14:26

LAB # 84-08-105

EPARED Radian Analutical Services	P. O. Box 9948	Austin, Texas 78766	ATTEN	PHONE (512) 454-4797			•
	TO B1 4	ramento	ATTEN Waune Pearce		CLIENT MCCLELLAN AF SAMPLES 4	Y McClellan AFB	>
REPOR	<b>—</b>		ATTE		CLIEN	COMPAN	FACILITY

CONTACT CONDVER

Only 1, 2-dichloroethane and trichloroethene consecond column confirmation performed on all four firmed for OIC due to 1:50 dilution required. samples.

> RB-6-3, 175-180 RB-6-4, 195-348 200 CM SAMPLE IDENTIFICATION 135-140 95-100 RB-6-2, RB-6-1, 의영입회

under separate cover

INVOICE

212-027-16

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WORK ID Recon Boring

8/6/84

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hand carried

TRANS TYPE CA E Calcium, ICPES and NAMES used on this report EPA Method 601/GC Magnesium, ICPES Sodium, ICPES ron, ICPES Chloride IC Bicarbonate Sulfate IC Carbonate HCO3 A NA E SO4 IC GC 601 CA ECCO3 FE E

# KADIAK

LAB # 84-08-105	7-7-88	Sample 04 (entered units)	30	학간	20	0.88	84	12	21	80j 4+
REPORT	ES    RR-6-3	Sample 03	56	<u>C3</u>	55	0.36	98	ET .	50	7.7
ical S	RESULIS BY LEST	Sample 02 (entered units)	54	29	₽	9 %	140	18	24	10
Analyt	88-6-1	Sample 01	49	69	₽	<u></u>	240	36	33	18
PAGE 2	KECEIVED: 08/10/84	TEST CODE     default units	CA E		·		HCO3_A	n 0	NA E	S04 IC

# RADIAN CORPORATION

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PAGE 3 RECEIVED: 08/10/84

LAB # 84-08-105

FRACTION OIC TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/09/84 Category Analytical Serv REPORT Results by Sample SAMPLE ID RB-6-1, 95-100

T MCL VERIFIED BY JSG	COMPOUND RESULT	Trichloroethene 242	Dibromochloromethane * ND	1, 1, 2-Trichloroethane * ND	cis-1, 3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1, 1, 2, 2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1,3-Dichlorobenzene 41.6	1,2-Dichlorobenzene ND	1,4-Dichlorobenzene ND			
ANALYST INSTRUMENT	SCAN	נט		1							9					
A DATE INJECTED 08/16/84	COMPOUND RESULT	Chloromethane ND !	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1,1-Dichloroethene 19,7	1,1-Dichloroethane 5.1	trans-1,2-Dichloroethene 2.3	Chloroform ND	1,2-Dichloroethane 110	1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND :
DATA FILECONC. FACTOR	SCAN							1	Cu	6		4				

2

trans-1, 3-Dichloropropene

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RECEIVED: 08/10/84

Analytical Serv RePORT Results by Sample

LAB # 84-08-105 Continued From Above

SAMPLE ID RB-6-1, 95-100

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/09/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{19/L}{1000}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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RECEIVED: 08/10/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-105

SAMPLE ID RB-6-2, 135-140

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/09/84

쐸 RESULT VERIFIED BY COMPOUNDS DETECTED RGS ANALYST INSTRUMENT DATE INJECTED 08/16/84 DATA FILE CONC. FACTOR

Trichloroethene SCAN 皇 RESULT Chloromethane COMPOUND SCAN

Dibromoch loromethane

S 2 **Bromomethane** Vinyl Chloride

S ᄝ Chloroethane Methylene Chloride

2 Trichlorofluoromethane

1, 1-Dichloroethene

욷 0 1, 1-Dichloroethane trans-1, 2-Dichloroethene

S Chloroform

S 1, 1, 1-Trichloroethane

S.

1, 2-Dichloroethane

S Carbon Tetrachloride

2 밁 Bromodichloromethane 1, 2-Dichloropropane

ᄝ trans-1, 3-Dichloropropene

NAME EPA Method 601/GC

Category

COMPOUND

1, 1, 2-Trichloroethane

2

S 2 cis-1, 3-Dichloropropene 2 2-Chloroethylvinyl Ether 2

Bromoform

2 1, 1, 2, 2-Tetrachloroethane

2 Tetrachloroethylene S Chlorobenzene

뮏 1, 3-Dichlorobenzene

1, 2-Dichlorobenzene

2

S 1, 4-Dichlorobenzene

#### RADIAN

PAGE 6 RECEIVED: 08/10/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-105 Continued From Above

SAMPLE ID RB-6-2, 135-140

FRACTION O2C TEST CODE GC 601
Date & Time Collected 08/09/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in  $\frac{49/L}{1}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-105

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NAME EPA Method 601/60 Category FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/09/84 SAMPLE ID RB-6-3, 1/5-180

98 COMPOUNDS DETECTED VERIFIED BY RGS ANALYST INSTRUMENT DATE INJECTED 08/16/84 DATA FILE CONC. FACTOR

C. FACTUR		- H	SCAN	COMPOUND DETECTED TO	ا آن
SCAN	COMPOUND	RESULT	SCAN		
	Chloromethane	Q		Trichloroethene ND	(~)
	Bromomethane	Q		Dibromochloromethane * ND	ابم
	Vinyl Chloride	Q		1, 1, 2-Trichloroethane * ND	1
	Chloroethane	2		cis-1,3-Dichloropropene * ND	m)
	Methylene Chloride	Q		2-Chloroethylvinyl Ether ND	~·I
	Trichlorofluoromethane			Bromoform ND	~I
	1, 1-Dichloroethene	Q		1,1,2,2-Tetrachloroethane # ND	<u>ر</u> ا
	1,1-Dichloroethane	2		Tetrachloroethylene # ND	~1
+	trans-1,2-Dichloroethene	Q		Chlorobenzene ND	اب.
	Chloroform	Q		1,3-Dichlorobenzene ND	اہ
1	1,2-Dichloroethane	0.2		1, 2-Dichlorobenzene ND	<b>ا</b> م
	1, 1, 1-Trichloroethane	Q		1, 4-Dichlorobenzene ND	. oi
	Carbon Tetrachloride	QN			

2

**Bromodichloromethane** 

2

1, 2-Dichloropropane

2

trans-1, 3-Dichloropropene

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Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-105 Continued From Above

SAMPLE ID RB-6-3, 175-180

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/09/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in uq/L unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

### K. A. DIAK.

RECEIVED: 08/10/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-105

SAMPLE ID RB-6-4, 195-260

NAME EPA Method 601/GC

Category

980 밀 2 S 2 2 밁 2 g 밁 2 밁 일 RESULT COMPOUNDS DETECTED VERIFIED BY Bromoform Trichloroethene 1, 3-Dichlorobenzene 1, 4-Dichlorobenzene 2-Chloroethylvinyl Ether Chlorobenzene 1,2-Dichlorobenzene cis-1,3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane Tetrachloroethylene COMPOUND RGS FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/09/84 ANAL YST INSTRUMENT SCAN DATE INJECTED 08/16/84 밁 밀 S 뮏 밁 밁 밁 S S S 윋 S 밁 S 일 밀 RESULT Chloroform Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1, 2-Dichloropropane trans-1, 3-Dichloropropene COMPOUND DATA FILE CONC. FACTOR SCAN

PAGE 10 RECEIVED: 08/10/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-105 Continued From Above

SAMPLE ID RB-6-4, 195-260

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/09/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in__

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PAGE 11 RECEIVED: 08/10/84

DUP 601 DUP 601 DUP 601 DUP 601

01D 02D 03D 04D

Analytical Serv REPORT NonReported Work

LAB # 84-08-105

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

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PAGE 1

LAB # 84-08-068

CONTACT CONDVER CERTIFIED BY Analytical Serv TEST CODES and NAMES used on this report PREPARED Radian Analutical Services Austin, Texas 78766 8501 MoPac Blvd (512) 454-4797 P. O. Box 9948 Analytical Serv REPORT 08/21/84 12:30:10 EPA Method 601/GC Magnesium, ICPES ICPES Sodium, ICPES Bicarbonate Chloride IC Iron, ICPES Sulfate IC Carbonate Calcium, ATTEN B NA E SO4 IC HCO3 A GC 601 CL IC C03 A FE E MG E SAMPLES INVOICE under separate cover TAKEN 8/5/84 & 8/6/84 SAMPLE IDENTIFICATION or Sacramento COMPANY MCCIellan AFB WORK ID Recon Boring Wayne Pearce CLIENT MCCLELLAN AF TRANS hand carried 212-027-16 RB 11-2- 130-140 RECEIVED: 08/07/84 02 RB 11 2, 130 1 03 RB 11 3, 130 1 04 RB 7-1, 95-100 REPORT Radian Austin TYPE H20 ATTEN FACILITY

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PAGE 11 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-068

	SAMPLE ID RB-/-1, 45-100		SAMPLE	5	SAMPLE # 04 FRACTIONS: A, B, C, D	A, B, C,		-	
			Date &	1 Me	Collected	98/0/84		Category	
	OL_10_	14 mg/L	CO3 A <1 FE E	1) 100 100 100 100 100 100 100 100 100 1	H.	8.9 ug/m1	HCO3 A as mg 7L as	8.9 HC03 A 78 MG E	13/60
_	S04_IC	6 mg/L							

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/05/84 ANALYST INSTRUMENT REPORT SCAN Results by Sample DATE INJECTED 08/10/84 S 밁 밁 S 윋 일 RESULT Q N S 밁 윋 QN N 2 Analytical Serv **Chloromethane Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1,1-Dichloroethane Chlaraform trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane COMPOUND SAMPLE ID RB-7-1, 95-100 RECEIVED: 08/07/84 DATA FILE CONC. FACTOR SCAN

LAB # 84-08-068

980

Category

NAME EPA Method 601/GC

일 S 2 밁 S 밁 RESULT 2 밁 밁 밁 일 VERIFIED BY COMPOUNDS DETECTED Bromoform Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene cis-1, 3-Dichloropropene COMPOUND RGS B

밁

1, 4-Dichlorobenzene

밁

Carbon Tetrachloride

2

Bromodichloromethane

밁

1,2-Dichloropropane

2

trans-1, 3-Dichloropropene

Cour Chierrolle

PAGE 13 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-068 Continued From Above

SAMPLE ID RB-7-1, 95-100

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/05/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

◆Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2~tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in_

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Analytical Serv REPORT NonReported Work

LAB # 84-08-068

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FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

PAGE 1 RECEIVED: 08/07/84

LAB # 84-08-071

Analytical Serv REPORT 08/21/84 12:35:25

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REPORT Radian TO B1 4 Austin Or Sacramento ATTEN Wayne Pearce CLIENT MCCLELLAN AF COMPANY McClellan AFB	PREPARED Radian Analytical Services BY 8501 MoPac Blvd. P. D. Box 9948 Austin, Texas 78766 ATTEN PHONE (512) 454-4797	CERTIFIED BY CONTACT CONDVER
WORK ID Recon. Boring TAKEN 8/7/84 TRANS hand carried TYPE H20 P.O. # 212-027-16 INVOICE UNDER SEPARATE COVER  SAMPLE IDENTIFICATION O1 RB-7-2, 135-140	Analytical Serv TEST CODES and NAMES used on this report	this report

EPA Method 601/GC

Bicarbonate.

GC 601 HCD3 A MG E NA E SO4 IC

Iron, ICPES

Carbonate

CA E CO CO A A FE E

Magnesium, ICPES Sodium, ICPES Sulfate IC

PAGE 2 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-071

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SAMPLE	D RB-7-2	SAMPLE ID RB-7-2, 135-140		SAMPLE	5	FRACTIONS: A, B, C, D	3: A, B, C,	. 0			
					Time	Date & Time Collected 08/07/84	8/20/80		Category	ħυ	
CA E	18	18 CL_IC_ug/m1	18 mg/L	CO3 A (1	(1) ac03	H.	1.8	1.8 HCO3 A	99 MG E	J. E	11
NA E	21	21 SO4 IC	S				,				1
	ug/m1	•	mg/L								

( )

LAB # 84-08-071	601 NAME EPA Method 601/GC 34 Category	r RGS VERIFIED BY JSG T A COMPOUNDS DETECTED 0	COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1,1,2,2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1, 3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1, 4-Dichlorobenzene ND				
REPORT Sample	TEST CODE GC 601	ANALYST INSTRUMENT	SCAN																
Analytical Serv Results by Sample	FRACTION OIC TEST CODE GC 60 Date & Time Collected 08/07/84	DATE INJECTED 08/10/84	COMPOUND	Chloromethane ND :	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1,1-Dichloroethane ND	trans-1,2-Dichloroethene ND	Chloraform ND	1,2-Dichloroethane ND	1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	trans-1, 3-Dichloropropene ND 1
/07/84	SAMPLE ID RB-7-2, 135-140	4	100					Me	Trichl	1,	1,	trans-1, 3		1,5	1,1,1	Carbo	Brome	7, 5	trans-1, 3
PAGE 3 RECEIVED: 08/07/84	SAMPLE ID RB	DATA FILE CONC. FACTOR	SCAN																

#### CURPURATION

PAGE 4 RECEIVED: 08/07/84

Serv REPURI Results by Sample Analytical Serv

LAB # 84-08-071 Continued From Above

SAMPLE ID RB-7-2, 135-140

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/07/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. NO = not detected at EPA detection limit method 601, (Federal Register, #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. unless otherwise specified. SCAN = scan number or retention time on chromatogram. 17 bn All results reported in__

PAGE 5 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-071

SAMPLE 1	ID RB-7-5	SAMPLE ID RB-7-3, 155-160		SAMPLE	# I	SAMPLE # 02 FRACTIONS: A, B, C, D	S: A, B, C	, D	Catanan	114	
A T	<u>~</u>	) I I)	Ξ	COS A			2 2	HCD3 A	128	ا م الح الح	=
5	1m/6n	lm/gu	mg/L	mg/L as CaCO3	CaCO3	] ] ]	ug/m1	ug/ml mg/L as CaCO3	CaC03	2	1m/6n
NA E	18	S04 IC	C								
	ug/m1		mg/L								

RECEIVED: 08/07/84

REPORT

LAB # 84-08-071

Category

NAME EPA Method 601/GC FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/07/84 Analytical Serv Results by Sample SAMPLE ID RB-7-3, 155-160

986 S 밁 Q N S Ž g S S RESULT 2 S 밁 Q VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene 2-Chloroethylvinyl Ether 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene COMPOUND RGS A ANALYST INSTRUMENT SCAN DATE INJECTED 08/10/84 뮏 S S 밁 밁 S 2 g 2 S S 밁 Q 뮏 N RESULT Chloromethane Chloroform Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichlorsethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1, 2-Dichloropropane COMPOUND Ø DATA FILE NC. FACTOR SCAN CONC

2

trans-1,3-Dichloropropene

#### CURPURATION

PAGE 7 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-071 Continued From Above

SAMPLE ID RB-7-3, 155-160

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/07/84

NAME EPA Method 601/GC Category

# NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram. All results reported in  $\underline{uq/L}$  unless otherwise specified.

PAGE 8 RECEIVED: 08/07/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

Analytical Serv REPORT NonReported Work

LAB # 84-08-071

DUP 601 DUP 601 01D 02D

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PAGE 1	Analytical Serv	Serv REPORT	LAB # 84-07-180
RECEIVED: 07/30/84	<b>*</b>	08/14/84 12:39:06	
REPORT Radian	īd	PREPARED <u>Radian Analutical Services</u>	s
TO B1. 4		BY 8501 MoPac Blvd.	<u> </u>
Austin		P.O. Box 9948	5
or Sacramento	amento	Austin, Texas 78766	CERTIFIED BY
ATTEN Wayne Pearce	earce	ATTEN	
		PHONE (512) 454-4797	CONTACT CONDVER
CLIENT MCCLELLAN AF	AN AF SAMPLES 1		
COMPANY McClellan AFB	an AFB		
FACILITY			
	<b>Ö</b>	GC-601/DUP-601 broken 7/31/84.	
WORK ID <u>Reconnaissance Boring</u>	issance Boring		
TAKEN 7/30/84, Toby	, Toby		
TRANS hand carried,	rried, Tobu		
TYPE H20			
P. O. # 212-027-16	-16		
INVOICE under se	under separate cover		

Analytical Serv TEST CODES and NAMES used on this report CA E Calcium, ICPES CL IC Chloride IC COS A Carbonate COS A Carbonate FE E Iron, ICPES

Calcium, ICP Chloride IC Carbonate Iron, ICPES

SAMPLE IDENTIFICATION OF MCC1ellan RB-B-1, 100'

Note: VOA Vials Backer During Handling -No EPA 601 Could be Peafoamed

Sodium, ICPES Sulfate IC

NA E SO4 IC

Bicarbonate Magnesium, ICPES

HCO3 A

#### CORPORATION SELECTION

PAGE 2 RECEIVED: 07/30/84

Analytical Serv REPORT Results by Sample

LAB # 84-07-180

Date & Time Collected 07/30/84 Category  CO3 A <1 FE E 4.4 HCO3 A 69 MG E  mg/L as CaCO3 Ug/ml mg/L as CaCO3	SAMPLE	D McCle	llan	SAMPLE ID McClellan RB-8-1, 100'	100,	SAMPLE #	01	FRACTIONS	A, B				
13 CL IC 14 CO3 A (1 FE E 4.4 HCO3 A 69 MG E 17 SO4 IC 4 A 17 SO4 IC 4 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L as CaCO3 Mg/L A 17 SO4 IC 4 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg/L A 18 CaCO3 Mg							e C	Collected	8/02//0	-	Categ	ıry	
ug/ml mg/L as CaCO3 ug/ml mg/L as CaCO3 ug/ml mg/L as CaCO3	CAE	13	ರ ~	C	14	C03 A	V	FE E		HCO3_A	69	MGE	9.5
17 S04 IC		ug/m]	, 1		mg/L	mg/L as CaC	03	l		se 7/6m	Caco3		ug/ml
	A E	17	ès.	JI t	4								
	] !	ug/m]	۱		mg/L								

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PAGE 1 RECEIVED: 07/31/84

Analytical Serv

Serv REPORT 08/14/84 12:31:43

LAB # 84-08-011

or Sacramento Wayne Pearce REPORT Radian TO B1 4 Austin ATTEN

SAMPLES McClellan AFB MCCLELLAN AF

> CL IENT COMPANY FACILITY

PREPARED <u>Radian Analutical Services</u> BY 8501 MoPac Blvd. Austin, Texas 78766 (512) 454-4797 P. O. Box 9948 ATTEN

CONTACT CONDVER CERTIFIED BY

> under separate cover WORK ID Recon. Boring hand carried 212-027-16 TAKEN 7/31/84 H20 TYPE TRANS INVOICE

Analytical Serv TEST CODES and NAMES used on this report

SAMPLE IDENTIFICATION

98-180

00 BB 10 10 00 BB 10 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10 BB 10

RB-8-2, 130-135 RB-8-3, 150-160

03 RB 10 04 RB 8-2 05 RB 8-3 06 RB 8-4

RB-8-4, 185-200

Calcium, ICPES Chloride IC

EPA Method 601/GC ron, ICPES Bicarbonate Carbonate HCO3 A GC 601 CO3 A FE E

Magnesium, ICPES Sodium, ICPES Sulfate IC NA E SO4 IC MG E

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Analytical Serv REPORT Results by Sample

LAB # 84-08-011

	11 Im/gu	
Į.	₩ E	
Category	99 Cac03	
d , D	1.7 HC03 A 99 MG E	
S. A. B. C. 07/31/8	1. 7 ug/m1	
SAMPLE # 04 FRACTIONS: A, B, C, D Date & Time Collected 07/31/84	3, 1,	
# 04 Time	(1 ac03	
SAMPLE Date &	CO3 A (1 FE E mg/L as CaCO3	
	22 mg/L	7 mg/L
SAMPLE ID RB-8-2, 130-135	01_10	S04_IC
RB-8-2	15	21
SAMPLE ID	CA_E	NA_E_



Serv REPORT Results by Sample DATE INJECTED 08/09/84 FRACTION 04C Ž 2 2 2 윋 밁 S 뮏 오 RESULT Analytical Serv Chloromethane **Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride 1, 1-Dichloroethane Trichlorofluoromethane 1, 1-Dichloroethene trans-1,2-Dichloroethene COMPOUND SAMPLE ID RB-8-2, 130-135 PAGE 12 RECEIVED: 07/31/84 DATA FILE CONC. FACTOR SCAN

LAB # 84-08-011

980 2 2 밁 2 밁 윋 일 일 S RESULT 밁 뮏 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene . Category COMPOUND RGS TEST CODE GC 601 Date & Time Collected 07/31/84 ANALYST INSTRUMENT SCAN 2 일 밀 뮏 일 밀 Chloraform 1,2-Dichloroethane Carbon Tetrachloride trans-1, 3-Dichloropropene 1, 1, 1-Trichloroethane Bromodichloromethane 1,2-Dichloropropane

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PAGE 13 RECEIVED: 07/31/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-011 Continued From Above

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SAMPLE ID RB-8-2, 130-135

FRACTION 04C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 07/31/84 Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram

PAGE 14 RECEIVED: 07/31/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-011

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	 	 <u></u> 1			
			ug/m1		
	ory	MG E			
	Category	80	Cacos		
D		HC03 A 80 MG E	mg/L as		
FRACTIONS: A, B, C, D	07/31/84		ug/ml		
FRACTION	Collected	E E			
SAMPLE # 05		7	as CaCO3		
SA		C03 A	mg/L		
		18	mg/L	5	mg/L
150-160		)I TO		S04 IC	
SAMPLE ID RB-8-3, 150-160		14	ug/m]	20	ug/ml
SAMPLE		CA E	   	₩ E	

RECEIVED: 07/31/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-011

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150-160
) RB-8-3, 1
SAMPLE 1D

TEST CODE GC 601 NAME EPA Method 601/GC lected 07/31/84 Category	RGS VERIFIED BY JSG A COMPOUNDS DETECTED 0	COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND
TEST CODE GC 601 ected 07/31/84	ANALYST INSTRUMENT	SCAN		1		ci
FRACTION 05C TEST CODE GC 60 Date & Time Collected 07/31/84	DATE INJECTED 08/09/84	JND RESULT	Chloromethane ND :	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND :
SAMPLE ID RB-8-3, 150-160	DATA FILE A CONC. FACTOR	SCAN COMPOUND				

QN	Q	ND	Q	Q	QN	N	QN	QN	QN
1,1,2-Trichloroethane *	cis-1,3-Dichloropropene *	2-Chloroethylvinyl Ether	Bromoform	1,1,2,2-Tetrachloroethane #	Tetrachloroethylene #	Chlorobenzene	1,3-Dichlorobenzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene
Ì								,	

S

Trichlorofluoromethane

Methylene Chloride

윋

1,1-Dichloroethene

2

1, 1-Dichloroethane

윋

trans-1, 2-Dichloroethene

밁

1, 2-Dichloroethane

밁

Chloroform

밁

1, 1, 1-Trichloroethane

2

Carbon Tetrachloride

밁

Bromodichloromethane

윋

1, 2-Dichloropropane

2

trans-1,3-Dichloropropene

#### CORPORATION

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Analytical Serv REPORT Results by Sample

LAB # 84-08-011 Continued From Above

7/31/84

SAMPLE ID RB-8-3, 150-160

FRACTION 05C TEST CODE GC 601 Date & Time Collected 07/31/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

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Analytical Serv REPORT Results by Sample

LAB # 84-08-011

	11 ug/m1	
lory	MGE	
Category	Cacco3	
, D	HCO3 A 83 MG E	
S: A, B, C 07/31/8	2.0 ug/m1	
SAMPLE # 06 FRACTIONS: A,B,C,D Date & Time Collected 07/31/84	<u>u</u>	
11me   06	(1 CaCO3	
SAMPLE Date 8	CO3 A (1	
	18 mg/L	9 / fw
SAMPLE ID RB-8-4, 185-200	15 CL_IC	. S04_IC
D RB-8-4	15 ug/m1	22 ug/m1
SAMPLE	CA E	NA E



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Analytical Serv REPORT Results by Sample

LA3 # 84-08-011

.

NAME EPA Method 601/GC Category FRACTION OGC TEST CODE GC 601 Date & Time Collected 07/31/84 SAMPLE ID RB-8-4, 185-200

986 2 2 Ñ S 2 2 밁 밁 ᄝ S 밁 2 RESULT VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane COMPOUND RGS A ANALYST INSTRUMENT SCAN DATE INJECTED 08/09/84 밁 S 윋 2 S 일 밁 윋 밁 ᄝ 윋 밁 욷 밁 2 2 RESULT **Chloromethane** Vinyl Chloride 1, 1-Dichloroethane trans-1,3-Dichloropropene Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene trans-1,2-Dichloroethene Chloroform 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane COMPOUND DATA FILE CONC. FACTOR SCAN

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PAGE 19 RECEIVED: 07/31/84

Analytical Serv REPORI Results by Sample

LAB # 84-08-011 Continued From Above

SAMPLE 1D RB-8-4, 185-200

FRACTION OGC TEST CODE GC 601 Date & Time Collected 07/31/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram.

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Serv REPORT NonReported Work Analytical Serv

LAB # 84-08-011

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE DUP 601 DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D 05D

LAB # 84-08-088

LAB # 84-08-088	Abuel Hurman CERTIFIED BY CONTACT CONOVER		this report
PAGE 1 RECEIVED: 08/08/84 Analytical Serv REPORT CAI	REPORT Radian  TO B1 4  Austin  CLIENT MCCLELLAN AF  COMPANY  FACILITY  REPARED Radian Analytical Services  BY 8501 MoPac Blvd. P. D. Box 9948  Austin, Texas 78766  Austin, Texas 78766  Austin, Texas 78766  PHONE (512) 454-4797  FACILITY	WORK ID Recon Boring TAKEN 8/8/84, D. Rickmann TRANS hand carried TYPE H20 P O # 212-027-16 INVOICE under separate cover	SAMPLE IDENTIFICATION         Analytical Serv TEST CODES and NAMES used on this report           01 RB-9-1, 99-100         CA E         Calcium, ICPES           02 RB-9-2, 120         CL IC         Chloride IC           03 RB-9-3, 140-160         CO3 A         Carbonate           04 RB-9-4, 165-180         EE         Iron, ICPES           04 RB-9-4, 165-180         Bicarbonate           MG E         Magnesium, ICPES           NA E         Sodium, ICPES           SOA IC         Sulfate IC

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PAGE 2 RECEIVED: 08/08/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-088

SAMPLE	SAMPLE ID RB-9-1, 99-100	, 99-100		SAMPLE # Date & T	ol Fi	SAMPLE # 01 FRACTIONS: A,B,C,D Date & Time Collected 08/08/84	A, B, C, )8/08/84		Category	ry .	
CA E	32 ug/m1	32 CL_IC_ug/m1	21 mg/L	CO3 A 54 FE E	54 F	i i	0.51 ug/m1	0.51 HC03 A 88 MG E	88 Ca CO3	MG_E	11 ug/m1
A E	26 S ug/m1	SO4_IC	20 mg/L								

RECEIVED: 08/08/84

REPORT Analytical Serv

Results by Sample

LAB # 84-08-088

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/08/84 SAMPLE ID RB-9-1, 99-100

**JSG** COMPOUNDS DETECTED VERIFIED NAME EPA Method 601/GC Category 되 ANALYST INSTRUMENT DATE INJECTED 08/14/84 Ø DATA FILE CONC. FACTOR

COMPOUND SCAN 2 RESULT Chloromethane COMPOUND SCAN

S Q Vinyl Chloride Bromomethane

S S Methylene Chloride Chlaroethane

о О S Trichlorofluoromethane 1, 1-Dichloroethene S 1, 1-Dichloroethane S trans-1, 2-Dichloroethene

S Chloroform

1, 2-Dichloroethane

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윋 1, 1, 1-Trichloroethane

2 Carbon Tetrachloride

밁 1, 2-Dichloropropane

Bromodichloromethane

S

2 trans-1, 3-Dichloropropene

Trichloroethene

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Dibromochloromethane

RESULT

욷 1, 1, 2-Trichloroethane

S g 2-Chloroethylvinyl Ether cis-1, 3-Dichloropropene

Q Bromoform S Tetrachloroethylene

윋

1, 1, 2, 2-Tetrachloroethane

S 1, 3-Dichlorobenzene

Chlorobenzene

2

2 1, 2-Dichlorobenzene 2 1, 4-Dichlorobenzene

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Analytical Serv REPORT Results by Sample

LAB # 84-08-088 Continued From Above

SAMPLE 1D RB-9-1, 99-100

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/08/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

	טחוו בר זו עם ז בי זבט	7 160		SAMPLE Date &	# H	Date & Time Collected 08/08/84	S. A, B, C 08/08/8	7	Category	
CA_E	20	CL_IC	18	CO3 A C1 FE E		FE	4. C.3	HCO3_A	4.2 HC03 A 99 MG E	11
	1 III / fin		1/6W	mg/r as	cacus		1€/6n	mg/L as	Cacu3	ug/m]
NA E	22	S04_IC	=							
	ug/ml		mg/L							

VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/60 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane Tetrachloroethylene cis-1, 3-Dichloropropene LAB # 84-08-088 Category COMPOUND AC. FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/08/84 ANALYST INSTRUMENT Analytical Serv REPORT Results by Sample SCAN DATE INJECTED 08/14/84 일 S 밁 2 2 밁 뮏 밁 2 밁 윋 2 RESUL T Chloroform Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride COMPOUND SAMPLE 1D RB-9-2, 120 RECEIVED: 08/08/84 DATA FILE CONC. FACTOR SCAN

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RESULT

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S

Bromoform

S

2

2

2

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Bromodichloromethane

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1, 2-Dichloropropane

밁

trans-1, 3-Dichloropropene

밁

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Analytical Serv REPORT Results by Sample

LAB # 84-08-088 Continued From Above

SAMPLE ID RB-9-2, 120

FRACTION O2C TEST CODE GC 601
Date & Time Collected 08/08/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2—trichloroethane and cis-1,3-dichloropropene co-elute All results reported in  $\frac{uq/L}{v}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute SCAN = scan number or retention time on chromatogram. All results reported in_

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Analytical Serv REPORT Results by Sample

LAB # 84-08-088

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	17	
Category	HCO3 A 98 MG E	
34 34	HCO3 A as	
SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 08/08/84	3. 7 m/gu	
FRACTI Collect	m 	
£ # 03 7 ime	(1) cac03	
SAMPL	CO3 A (1 FE E mg/L as CaCO3	
	20 mg/L	7, 5 mg/L
SAMPLE ID RB-9-3, 140-160	22 CL_IC	S04_IC
D RB-9-3	13 109/01	21 ug/m1
SAMPLE	CA E	NA_E

REPORT LAB # 84-08-088 mple	TEST CODE GC 601 NAME EPA Method 601/GC ected 08/08/84 Category	ANALYST MCL VERIFIED BY JSG INSTRUMENT A COMPOUNDS DETECTED O	SCAN COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1, 1, 2, 2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1,3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1,4-Dichlorobenzene ND				
Analytical Serv Results by Sample	FRACTION 03C TEST CODE GC 6 Date & Time Collected 08/08/84	DATE INJECTED 08/14/84	COMPOUND	Chloromethane ND :	Bromomethane ND :	Vinyl Chloride ND	Chloroethane ND	Methylene Chlaride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1,1-Dichloroethane ND ;	trans-1,2-Dichloroethene ND	Chloroform ND	1,2-Dichloroethane ND	1,1,1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	-
PAGE 9 RECEIVED: 08/08/84	SAMPLE ID RB-9-3, 140-160	DATA FILE A	SCAN					Met	Trichlo	1.1	1.1	trans-1, £		1, 8	1, 1, 1-	Carbo	Вгома	1,2-	

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Analytical Serv REPORT Results by Sample

LAB # 84-08-088 Continued From Above

SAMPLE 1D RB-9-3, 140-160

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/08/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram

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Analytical Serv REPORT Results by Sample

SAMPLE	1D RB-9-4	SAMPLE ID RB-9-4, 165-180		SAMPLE	<b>*</b>	SAMPLE # 04 FRACTIONS: A, B, C, D	S: A, B, C,				
				Date &	1me	Collected	8/80/80		Category	<b>-</b>	
CA E	19 CL IC	)I 7)	21	CO3 A <1 FE E		ш		2.3 HC03 A 93 MG E	93 M		13
1	ug/ml	1	mg/L	mg/L as C	ac03	1		mg/L as	CaCO3		ug/ml
NA E	24	24 S04 IC	7.0								
	ug/ml		mg/L								

1, 1, 2, 2-Tetrachloroethane FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/08/84 ANALYST INSTRUMENT Analytical Serv REPORT Results by Sample SCAN DATE INJECTED 08/14/84 밀 밁 2 2 윋 2 밁 S 2 밁 S 일 RESULT Chloromethane Vinyl Chloride Chloroform Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1,2-Dichloroethane 1, 1, 1-Trichloroethane COMPOUND SAMPLE ID RB-9-4, 165-180 4 RECEIVED: 08/08/84 DATA FILE CONC. FACTOR SCAN

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VERIFIED BY COMPOUNDS DETECTED

ACL M <

NAME EPA Method 601/GC

Category

LAB # 84-08-088

RESULT

COMPOUND

Trichloroethene

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Dibromochloromethane

1, 1, 2-Trichloroethane

Q

Q N

밁

2-Chloroethylvinyl Ether

cis-1,3-Dichloropropene

Q

Bromoform

N

S

**Tetrachloroethylene** 

S

Chlarobenzene

밁

1, 3-Dichlorobenzene

밁

1, 4-Dichlorobenzene

S

Carbon Tetrachloride

윋

Bromodichloromethane

밁

trans-1, 3-Dichloropropene

2

1, 2-Dichloropropane

밁

1, 2-Dichlorobenzene

## COMPURATION

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Analytical Serv Results by Sample

LAB # 84-08-088 Continued From Above

SAMPLE 10 RB-9-4, 165-180

FRACTION 04C TEST CODE GC 601 Date % Time Collected 08/08/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

◆Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3-dichloropropene co-elute All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

Analytical Serv REPORT NonReported Work FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE PAGE 14 RECEIVED. 08/08/84

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D



CONTACT CONDVER CERTIFIED BY LAB # 84-08-011 PREPARED Radian Analytical Services Austin, Texas 78766 8501 MoPac Blvd (512) 454-4797 REPORT Box 9948 Analytical Serv REPG 08/14/84 12:31:43 Р О BY PHONE ATTEN SAMPLES or Sacramento COMPANY McClellan AFB FACILITY Wayne Pearce CLIENT MCCLELLAN AF RECEIVED: 07/31/84 Austin REPORT Radian ATTEN

Analytical Serv TEST CODES and NAMES used on this report EPA Method 601/GC Magnesium, ICPES ICPES Sodium, ICPES Chloride IC Iron, ICPES Bicarbonate Sulfate IC Carbonate Calcium, HCD3 A NA E SO4 IC GC 601 C03 A FEE SAMPLE IDENTIFICATION 138-140 RB-10-2, 98-100 RB 8 8 130 135 150 150 RB-10-1, 78-80 01 RB-10-1, 02 RB-10-2, 03 RB-10-3, 04 RB B-2, 06 RB-B-3,

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Analytical Serv REPORT Results by Sample

SAMPLE ID RB-10-1, 78-80	D RB-10-		78-80		SAMPLE	10#	SAMPLE # 01 FRACTIONS: A, B, C, D	3: A, B, C,	D		
*** *** **						Time	Collected	07/31/8		Category	
CA E	24	24 CL_IC	21	26	CO3 A (1	(1)	(1 FE E	4.7	4.7 HC03 A	120 MG E	19
A E	26		S04 IC	10	i   			1 			 
	ug/ml			mg/L							·

RECEIVED: 07/31/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-011

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 07/31/84 SAMPLE ID RB-10-1, 78-80

RGS A ANALYST INSTRUMENT

080 VERIFIED BY COMPOUNDS DETECTED 밁

S

2

1, 1, 2-Trichloroethane

cis-1, 3-Dichloropropene

2

2

2-Chloroethylvinyl Ether

2

Bromoform

일

1, 1, 2, 2-Tetrachloroethane

2

**Tetrachloroethylene** 

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Chlorobenzene

밁

1, 3-Dichlorobenzene

임

1, 2-Dichlorobenzene

딀

1,4-Dichlorobenzene

RESULT COMPOUND SCAN RESULT COMPOUND DATA FILE CONC FACTOR SCAN

DATE INJECTED 08/09/84

Trichloroethene Dibromochloromethane 윋 윋 Chloromethane Bromomethane

2 Vinyl Chloride

S Chloroethane

Q Methylene Chloride

Trichlorofluoromethane

윋

1, 1-Dichloroethene

윋

1, 1-Dichloroethane

S

trans-1,2-Dichloroethene

밁

밁 Chloroform

S 1, 2-Dichloroethane

밁 1, 1, 1-Trichloroethane

Carbon Tetrachloride

윋

Bromodichloromethane

일 1, 2-Dichloropropane 밁

trans-1,3-Dichloropropene

윋

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Analytical Serv REPORT Results by Sample

LAB # 84-08-011 Continued From Above

SAMPLE ID RB-10-1, 78-80

Date & Time Collected 07/31/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. <u>ug/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

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Analytical Serv REPORT Results by Sample

SAMPLE	-10- -01- -01-	SAMPLE ID RB-10-2, 98-100		SAMPL	SAMPLE # 02	FRACTIONS: A, B, C, D	45: A, B, C	, D	Catenorii		
CA E	22	)I 1)	24	CO3 A <1		H H	2.2	2.2 HCO3 A 110 MG E	110	AG E	18
   	ug/ml		mg/L	mg/L as	caco3		ug/m]	mg/L as	cacos	     	ug/m1
NA E	25	S04 IC	10								
	ug/m]		mg/L								

PAGE 6 RECEIVED: 07/31/84

Analytical Serv REPC Results by Sample

REPORT

LAB # 84-08-011

SAMPLE ID RB-10-2, 98-100

NAME EPA Method 601/GC Category FRACTION O2C TEST CODE GC 601 Date & Time Collected 07/31/84

156 윋 윋 뮏 밁 윉 RESULT S S 2 윋 밁 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene COMPOUND RGS A ANALYST INSTRUMENT SCAN DATE INJECTED 08/09/84 밁 2 밁 S 2 2 밁 밁 밁 2 RESULT 윋 일 밁 Ž 윋 Chloromethane Bromomethane Vinyl Chloride Methylene Chloride 1,1-Dichloroethane Chloroform 1, 1, 1-Trichloroethane 1,2-Dichloropropane Chloroethane Trichlorofluoromethane 1, 1-Dichloroethene trans-1, 2-Dichloroethene 1,2-Dichloroethane Carbon Tetrachloride Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

밁

trans-1, 3-Dichloropropene



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Results by Sample Analytical Serv

REPORT

LAB # 84-08-011 Continued From Above

SAMPLE ID RB-10-2, 98-100

FRACTION 02C TEST CODE GC 601 Date & Time Collected 07/31/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. <u>uq/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

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Analytical Serv REPORT Results by Sample

	110 ug/m1	
Category	77 MG E	
	HCO3 A 77 MG E	
SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 07/31/84	47	
FRACTI Collect		
# 03 % Time	13 A <1 mg/L as caco3	
SAMPI	CO3 A mg/L as	
	21 mg/L	9 / fw
SAMPLE ID RB-10-3, 138-140	CL_1C_	S04_IC
D RB-10-	120 ug/m1	25 ug/m1
SAMPLE	CA_E	NA_E

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REPORT Analytical Serv Results by Sample

LAB # 84-08-011

SAMPLE ID RB-10-3, 138-140

FRACTION OGC TEST CODE GC 601 Date & Time Collected 07/31/84

NAME EPA Method 601/GC

986 N S 밁 皇 S g 2 RESULT S 2 욷 2 2 COMPOUNDS DETECTED VERIFIED Trichioroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1,4-Dichlorobenzene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2-Trichloroethane Category COMPOUND RGS **«** ANALYST INSTRUMENT SCAN DATE INJECTED 08/09/84 S 밁 S S S 0.4 S 밁 윋 N 밁 밁 QN 뮏 S S RESULT Chloroform 1,2-Dichloroethane 1,2-Dichloropropane Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane trans-1, 3-Dichloropropene COMPOUND VI DATA FILE SCAN CONC

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REPORT Analytical Serv Results by Sample

LAB # 84-08-011 Continued From Above

SAMPLE ID RB-10-3, 138-140

NAME EPA Method 601/GC Category FRACTION 03C TEST CODE GC 601 Date & Time Collected 07/31/84

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN ≈ scan number or retention time on chromatogram.

RECEIVED: 08/02/84 PAGE 1

Analytical Serv REP( 08/14/84 12:23:31

REPORT

LAB # 84-08-015

or Sacramento Wayne Pearce REPORT Radian TO Bl. 4 Austin ATTEN

PREPARED Radian Analytical Services Austin, Texas 78766 BY 8501 MoPac Blvd (512) 454-4797 Box 9948 PHONE ATTEN

CERTIFIED BY

CONTACT CONOVER

SAMPLES McClellan AFB MCCLELLAN AF COMPANY FACILITY CLIENT

TAKEN 8/1/84, Toby Walters INVOICE under separate cover WORK ID Recon Boring hand carried P 0. # 212-027-16 TYPE TRANS

SAMPLE IDENTIFICATION 01 RB-10-4, 159-160

Analytical Serv TEST CODES and NAMES used on this report Calcium, ICPES Chloride IC

EPA Method 601/GC Magnesium, ICPES Sodium, ICPES Iron, ICPES Bicarbonate Sulfate IC Carbonate NA E SO4 IC HCO3 A C03 A GC 601 FEE MG E

PAGE 2 RECEIVED: 08/02/84

Analytical Serv REPORT Results by Sample

SAMPLE IL	RB-10-	SAMPLE ID RB-10-4, 159-160		SAMPLE # 01	10	FRACTIONS: A, B, C, D	S: A, B, C,	Q	0-4-6		
				Date &	1 me	Collected UB/UI/B4	08/01/80		rategory		-
CA E	4	) CL 10	17	CO3 A <1	$\Box$	щ	1.7	HC03 A 75 MG E	75 MG		
	ug/ml	1	mg/L	mg/L as Ca	3C03	<b>!</b>	ug/ml	mg/L as	CaCO3	ug/m]	Ę
NA E	20	20 SD4 IC	J.								
1	ug/m1	1	Mg/L								-

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050 RESULT 2 밁 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Tetrachloroethylene 1, 1, 2, 2-Tetrachloroethane LAB # 84-08-015 Category COMPOUND RAM FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/01/84 ANALYST INSTRUMENT REPORT SCAN Analytical Serv Results by Sample DATE INJECTED 08/09/84 2 2 S 2 밁 Ž Ñ S g RESULT 2 윋 S Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene Chloroform 1,2-Dichloroethane 1, 1, 1-Trichloroethane COMPOUND SAMPLE ID RB-10-4, 159-160 4 RECEIVED: 08/02/84 DATA FILE CONC. FACTOR SCAN

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RECEIVED: 08/02/84

REPORT Analytical Serv REMUN Results by Sample

LAB # 84-08-015 Continued From Above

NAME EPA Method 601/GC Category

SAMPLE ID RB-10-4, 159-160

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/01/84

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 5 RECEIVED: 08/02/84

Analytical Serv REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

**DUP 601** 010

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PAGE 1 RECEIVED: 08/07/84	Analytical Serv 08/21/8	Serv 08/21/84 12:30:10	LAB # 84-08-068
REPORT Radian  TO B1 4  Austin  Or Sacramento  ATTEN Wayne Pearce  CLIENT MCCLELLAN AF  COMPANY MCClellan AFB  FACILITY	PREPARED BY ATTEN SAMPLES 4	Radian Analytical Services 8501 MoPac Blvd. P.O. Box 9948 Austin, Texas 78766 (512) 454-4797	CERTIFIED BY CONTACT CONDVER
MORK ID Recon Boring TAKEN 8/5/84 % 8/6/84 TRANS hand carried TYPE H20 P O # 212-027-16 INVOICE UNder separate cover SAMPLE IDENTIFICATION 01 RB-11-1, 98-100 02 RB-11-2, 130-140 03 RB-11-3, 98-100		Analytical Serv TEST CODES and NAMES used on this report cate in the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of the second control of t	on this report

PAGE 2 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

SAMPLE	(D) RB-11-	SAMPLE ID RB-11-1, 98-100		SAMPLE # 01	FRACTIONS:	A, B, C,	Q		
				Date & Time Collected 08/06/84	Collected (	8/90/8	4	Category	
CA E	15	2 CL_IC	20	(03 A (1)		1.1	HCO3 A	HCO3 A 90 MG E	11
N E	21	SO4 IC				1 : : : :	i j j		, 71 0
	ug/ml	ug/m1	mg /L						

PAGE 3 RECEIVED: 08/07/84		Analytical Serv Results by Sample	չ իզ	REPORT mple	LAB # 84-08-068
SAMPLE ID RB-11-1, 98-100	98-100	FRACTION 01C Date & Time	0011	FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/06/84	NAME EPA Method 601/GC Category
DATA FILE CONC. FACTOR	B	DATE INJECTED <u>08/10/84</u>	784	ANALYST INSTRUMENT	NES VERIFIED BY JSG  B COMPOUNDS DETECTED 1
SCAN	COM	COMPOUND	<b>⊢</b>	SCAN	COMPOUND RESULT
		Chloromethane N	일		Trichloroethene ND
		Bromomethane N	 Q		Dibromochloromethane * ND
		Vinyl Chloride N	 임		1, 1, 2-Trichloroethane * ND
		Chloroethane N	Q	0.1	cis-1,3-Dichloropropene * ND
	Met	Methylene Chloride N	Q		2-Chloroethylvinyl Ether ND
1	Trichlo	Trichlorofluoromethane 0.2			Bromoform ND
	1,1	1,1-Dichloroethene N	Q	1, 1,	1,1,2,2-Tetrachloroethane # ND
	1,1	1,1-Dichloroethane N	Q		Tetrachloroethylene # <u>ND</u>
	trans-1, 2	trans-1,2-Dichloroethene N	의		Chlorobenzene ND
1		Chloroform N			1, 3-Dichlorobenzene ND
	1,2	1,2-Dichloroethane N	Q		1,2-Dichlorobenzene ND
	1, 1, 1-	1, 1, 1-Trichloroethane N	Ω Ω		1,4-Dichlorobenzene ND
	Carbo	Carbon TetrachlorideN	Q		
	Вгомо	Bromodich loromethane N	QN		
	1,2-	1, 2-Dichloropropane N	 임		
t1	rans-1,3-	trans-1, 3-Dichloropropene N	QN QN		

PAGE 4 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-068 Continued From Above

SAMPLE ID RB-11-1, 98-100

FRACTION 01C TEST CODE GC 601 Date & Time Collected 08/06/84

NAME EPA Method 601/GC Category

NOTES AND DEF'NITIONS FOR THIS REPORT

ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in_

PAGE 5 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

Category	1.3 HCO3 A 104 MG E 14	
C, D /84	HC03 A mg/L as	
SAMPLE # 02 FRACTIONS: A,B,C,D Date & Time Collected 08/06/84	-	
# 02 FRA( Time Coll(	CO3 A <1 FE E	
SAMPLE Date 8	CO3 A mg/L as	
	19 mg/L	9 7/6w
2, 130-140	CL_IC	S04_IC
SAMPLE ID RB-11-2, 130-140	19 CL_IC_ug/m1	19
SAMPLE	CA_E	NA E

	08/0/84
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AGE	ECE

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-068

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NAME EPA Method 601/GC FRACTION O2C TEST CODE GC 601 SAMPLE ID RB-11-2, 130-140

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1, 2-Dichloropropane

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trans-1, 3-Dichloropropene

3/06/84 Category	ANALYST RGS VERIFIED BY JSG INSTRUMENT B COMPOUNDS DETECTED 0	d COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND		Bromoform ND	_ 1,1,2,2-Tetrachloroethane # ND	Tetrachloroethylene #ND	Chlorobenzene ND	1,3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1,4-Dichlorobenzene ND		
Date & Time Collected OB/O6/84	B DATE INJECTED <u>08/10/84</u> AN INSTE	COMPOUND RESULT SCAN	Chloromethane ND	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1,1-Dichloroethane ND	trans-1,2-Dichloroethene ND ;	Chloroform ND	1,2-Dichloroethane ND	1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND
	DATA FILE CONC. FACTOR	SCAN					}									

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Analytical Serv REPURI Results by Sample

LAB # 84-08-068 Continued From Above

SAMPLE ID RB-11-2, 130-140

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/06/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

«Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram.

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Analytical Serv Results by Sample

SAMPLE	SAMPLE ID RB-11-3	က		SAMPLE # 03	ප ##	FRACTIONS: A, B, C, D	. A, B, C,	D			
				Date &	Time	Collected	8/90/80		Category	Į.	
CAE	20	20 CL IC	18	C03 A <1		ii iii	7.5	HCO3 A 101 MG E	101	MG E	17
	ug/m]	l	mg/L	mg/L as C	ac03		ug/m1	mg/L as	CaC03		ug/m]
N E	19	S04 IC	ß								
	ug/m1	1	mg/L								

		1		
PAGE 9 RECEIVED: 08/07/84	Analytical Serv Results	REPORI Its by Sample		LAB # 84-08-058
SAMPLE ID RB-11-3	FRACTION 03C Date & Time	Co11	TEST CODE GC 601 ected 08/05/84	NAME EPA Method 601/GC Category
DATA FILE CONC FACTOR	B DATE INJECTED 08.	08/10/84 AN	ANAL YST INSTRUMENT	RGS VERIFIED BY JSG  B COMPOUNDS DETECTED 0
SCAN	COMPOUND	RESULT		COMPOUND
	Chloromethane	- QN		Trichloroethene ND
	Bromomethane	QN		Dibromochloromethane * ND
	Vinyl Chloride	QN	<b>-</b>	1, 1, 2-Trichloroethane * ND
	Chloroethane	QN	CÌS	cis-1,3-Dichloropropene * ND
	Methylene Chloride	QN		2-Chloroethylvinyl Ether ND
**************************************	Trichlorofluoromethane	QN		Bromoform ND
	1,1-Dichloroethene	QN	1,1,6	1, 1, 2, 2-Tetrachloroethane # ND
	1,1-Dichloroethane	QN		Tetrachloroethylene # ND
t L	trans-1,2-Dichloroethene	Q		Chlorobenzene ND
-	Chloroform	QN		1,3-Dichlorobenzene ND
	1,2-Dichloroethane	QN		1,2-Dichlorobenzene ND
	1, 1, 1-Trichloroethane	QN		1, 4-Dichlorobenzene ND
	Carbon Tetrachloride	QN		
	Bromodichloromethane	QV		
	1,2-Dichloropropane	ΩN		
tra	trans-1,3-Dichloropropene	ND		

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PAGE 10 RECEIVED: 08/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-068 Continued From Above

SAMPLE ID RB-11-3

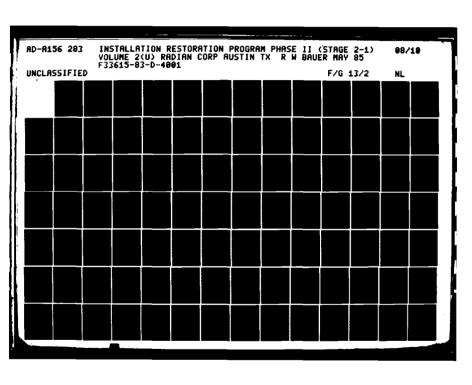
FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/06/84

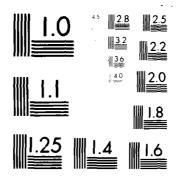
NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified SCAN = scan number or retention time on chromatogram All results reported in__

LAB # 84-08-047	CERTIFIED BY  CONTACT CONDVER		on this report
lytical Serv REPORT 08/21/84 12:25:50	PREPARED Radian Analytical Services BY 8501 MoPac Blvd. P 0. Box 9948 AUStin, Texas 78766 ATTEN PHONE (512) 454-4797		Analytical Serv TEST CODES and NAMES used on this report CA E Calcium, ICPES CL IC Chloride IC CO3 A Carbonate Iron, ICPES CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/GC CC 601 EPA Method 601/G
PAGE 1 RECEIVED 08/06/84	REPORT Radian  TD B1 4 Austin or Sacramento ATTEN Wayne Pearce  CLIENT MCCLELLAN AF COMPANY McClellan AFB	WORK ID Recon Boring TAMEN 8/3/84, D. Rickmann TRAMS hand carried TYPE H20 P. 0. # 212-027-16 INVOICE under separate cover	SAMPLE IDENTIFICATION  O1 RB-12-1. 89' O2 RB-12-2. 135-140 C03 RB-12-3. 170-180 FE F GC 601 HC03 A HC03 A FE F S04 IC





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SAMPLE ID RB-12-1, 89	, 68		SAMPLE # Date & Ti	ae C	SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/03/84	A, B, C, 08/03/8		Category	
CA_E 26 CL_IC	CL_IC	24 mg/L	CO3 A mg/L as Ca	(1 FE E	un ₁	111	HCO3 A mg/L as	11 HCO3 A 76 MG E	20 ug/m1
NA_E 27 S04_IC_	S04_IC	9 / 6 m							

LAB # 84-08-047	GC 601 NAME EPA Method 601/GC 3/84 Category	YST MCL VERIFIED BY JSG ENT A COMPOUNDS DETECTED 5	COMPOUND	Trichloroethene 0.7	Dibromochloromethane * ND	1, 1, 2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1,1,2,2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1, 3-Dichlorobenzene ND	1, 2-Dichlorobenzene ND	1, 4-Dichlorobenzene ND				
REPORT Sample	TEST CODE.	ANALYST INSTRUMENT	SCAN	S								1							
Analytical Serv Results by Sample	FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/03/84	DATE INJECTED 08/10/84	COMPOUND	Chloromethane ND :	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1, 1-Dichloroethene ND	1,1-Dichloroethane 1.2	trans-1, 2-Dichloroethene 1.3	Chloraform 0.1	1, 2-Dichloroethane 0.1	1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	
PAGE 3 RECEIVED: 08/06/84	SAMPLE 10 RB-12-1, 89'	DATA FILE A	SCAN						Tric		1	trans-	m	4	1,1	Cas	Вг		

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trans-1,3-Dichloropropene

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PAGE 4 RECEIVED: 08/06/84

Analytical Serv Results by Sample

LAB # 84-08-047 Continued From Above

SAMPLE ID RB-12-1, 89'

FRACTION 31C TEST CODE GC 601 Date & Time Collected 08/03/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\log L}{\log L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

CAMPIF IN RR-12-2, 135-140	18-12-	C	35-140		SAMPLE	# 05	FRACTIONS	A, B, C,	<u>_</u>			
ר י י	1	اد			Date &	Time	Date & Time Collected 08/03/84	3/03/8	-	Category	ħ	
	25	CL_1C_	21	22 mg / L	CO3 A (1 FE E	(1)	띠	13	13 HC03 A 97 MG E	97 M	<b>6</b> E	22 ug/m1
128	25	<b>S</b> 04	S04_1C	1/6w								

	08/06/84
PAGE 6	RECEIVED:

REPORT Analytical Serv

LAB # 84-08-047

Results by Sample SAMPLE ID RB-12-2, 135-140

786 2 밁 욷 2 일 밁 윋 RESULT 밀 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1,3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND ACI B FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/03/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/10/84 밀 뮏 밁 밀 밁 Z 윋 ᄝ 밁 0.2 밁 RESUL T 0 Chloromethane **Bromomethane** Methylene Chloride Chloroform Vinyl Chloride Chloroethane 1, 1-Dichloroethene 1,1-Dichloroethane trans-1, 2-Dichloroethene 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane trans-1, 3-Dichloropropene Trichlorofluoromethane COMPOUND 2 DATA FILE CONC. FACTOR SCAN

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PAGE 7 RECEIVED: 08/06/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-047 Continued From Above

SAMPLE ID RB-12-2, 135-140

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/03/84

NAME EPA Method 601/GC Category

# NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromachloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified SCAN = scan number or retention time on chromatogram All results reported in_

PAGE 8 RECEIVED: 08/06/84

Analytical Serv REPORT Results by Sample

SAMPLE	10 RB-12-	SAMPLE 1D RB-12-3, 170-180		SAMPLE Date &	# 03	SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 08/03/84	S: A, B, C 08/03/8	, D 4	Category	3	
CA_E	22 09/m1	OF IC	22 mg/L	CO3 A (1)	C03	<b>1</b>	1.3	HCO3 A 122 mg/L as caco3	122 M	MG E 16	<b>9</b> 7
NA E	25	S04_IC	7/6w								

VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1,4-Dichlorobenzene 1, 2-Dichlorobenzene NAME EPA Method 601/GC 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Tetrachloroethylene LAB # 84-08-047 Category COMPOUND RGS TEST CODE GC 601 Date & Time Collected 08/03/84 ANALYST INSTRUMENT SCAN Serv REPORT Results by Sample DATE INJECTED 08/10/84 FRACTION 03C 2 0 0.2 2 윋 S 밀 윋 밁 밁 2 밁 밁 2 RESUL.T Analytical Serv Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1,1-Dichloroethane trans-1, 2-Dichloroethene Chloroform 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride **Bromodichloromethane** COMPOUND SAMPLE ID RB-12-3, 170-180 RECEIVED: 08/06/84 DATA FILE CONC. FACTOR SCAN

0.2

S

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S

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뮏

Bromoform

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2

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trans-1, 3-Dichloropropene

윋

1,2-Dichloropropane

RESULT

C. Ja P. Coll. A. Yealer

PAGE 10 RECEIVED: 08/06/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-047 Continued From Above

SAMPLE ID RB-12-3, 170-180

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/03/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{19/L}{1}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 11 RECEIVED: 08/06/84

Analytical Serv REPORT NonReported Work

LAB # 84-08-047

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

#### EZ IN IDIAN COLLOGRAPIO

RECEIVED: 08/17/84

Analytical Serv

06/30/84 16:26:56

LAB # 84-08-180

or Sacramento Wayne Pearce REPORT Radian Austin ATTEN

CLIENT COMPANY

FACILITY

SAMPLES MCCLELLAN AF

PREP RED Radian Analutical Services
BY 8501 MoPac Blvd. Austin, Texas 78766 (512) 454-4797 P. O. Box 9948 PHONE ATTEN

CERTIFIED BY

CONTACT CONDVER

212-027-16 under separate cover INVOICE

Reconn Boring

WORK ID

8/16/84

TAKEN

hand 엺

TRANS

TYPE

SAMPLE IDENTIFICATION

RB-13-1, 95-100 RB-13-2, 115-120 RB-13-3, 135-140 RB-13-4, 195-200

김영영정

Analytical Serv TEST CODES and NAMES used on this report

Chloride IC ron, ICPES Carbonate CA E CL IC CO3 A

Magnesium, ICPES Sodium, ICPES Bicarbonate Sulfate IC 9C 601 HC03 A NA E SO4 IC 표 면 면

EPA Method 601/GC

#### KY AL COLOR

Analytical Serv REPORT Results by Sample

LAB # 84-08-180

PAGE 2 RECEIVED: 08/17/84

	17	
orų.	MG E	
Category	133	
0_	2.0 HC03 A 133 MG E	
SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/16/84	2.0 ug/m1	
FRACTION Collected	n 11	
k # 01 Time	(1 FE E	
SAMPL	CO3 A (1	
	29 mg/L	7 Mg/L
SAMPLE ID RB-13-1, 95-100	24 CL_IC_ug/m1	S04_IC
ID RB-13-	24	25
SAMPLE	CA_E	MA E

# KX AND IN

PAGE 3 RECEIVED: 08/17/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-180

SAMPLE ID RB-13-1, 95-100

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

ANALYST INSTRUMENT DATE INJECTED 08/23/84 8 DATA FILE CONC. FACTOR

VERIFIED BY COMPOUNDS DETECTED

900

RESULT

2

뮏

Trichloroethene Dibromochloromethane COMPOUND SCAN 윋 뒫 RESULT Chloromethane Bromomethane COMPOUND SCAN

1, 1, 2-Trichloroethane

뮏

Vinyl Chloride

S

Chloroethane

2

Methylene Chloride

月

Trichlorofluoromethane

윋

1, 1-Dichloroethene

뫼

1,1-Dichloroethane

trans-1, 2-Dichloroethene

윋

Chloroform

윋

1, 2-Dichloroethane

9 cis-1, 3-Dichloropropene 2 2-Chloroethylvinyl Ether 윋

Bromoform

뮏 1, 1, 2, 2-Tetrachloroethane

뮏 Tetrachloroethylene

윋 Chlorobenzene

뮏 1, 3-Dichlorobenzene

뮏 1, 2-Dichlorobenzene

1, 4-Dichlorobenzene

뮏

뮏 밁 1, 1, 1-Trichloroethane Carbon Tetrachloride

일 Bromodichloromethane

윋 1,2-Dichloropropane

trans-1, 3-Dichloropropene

윋

# LALA DIANA

PAGE 4 RECEIVED: 08/17/84

Analytical Serv Results by Sample

LAB # 84-08-180 Continued From Above

SAMPLE ID RB-13-1, 95-100

FRACTION OIC TEST CODE GC 601
Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene comelute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

# EX MIDIAN

PAGE 5 RECEIVED: 08/17/84

Analytical Serv REPORT Results by Sample

SAMPLE	AMPLE ID RB-13-2, 115-120	Ç	115-120		SAMPLE	20 **	SAMPLE # 02 FRACTIONS: A, B, C, D	5: A, B, C	O,			
					Date &	1 <b>J</b>	Collected	08/19/8	4	Category	J.C.	
CA E	20	טר ונ	21	R	CO3 A	7	FEE	6. 1	6. 1 HC03 A 98	98	98 MG E	14
	ug/m1	•		mg/L	mg/L as CaCO3	ac03	1	ug/ml	mg/L as	C9C03		1m/6n
¥ E	22	සි	S04 IC	œ								
	Cg/m1			J/6w								

# CONTROP AND CONTROLS

RECEIVED: 08/17/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-180

NAME EPA Method 601/GC Category TEST CODE 6C 601 Date & Time Collected 08/16/84 FRACTION 02C SAMPLE ID RB-13-2, 115-120

950 윋 뮏 뒫 윋 RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene 2-Chloroethylvinyl Ether Bromoform 1, 4-Dichlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene Chlorobenzene Dibromoch loromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene COMPOUND KMX B ANALYBT INSTRUMENT SCAN DATE INJECTED 08/23/84 2 2 윋 月 g 月 뮏 윋 月 뮏 윋 윋 뮏 물 S 뮏 RESULT Chloromethane Chloroform Bromomethane Vinyl Chloride Chloroethane Methylene Chloride 1, 1-Dichloroethene Trichlorofluoromethane 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride 1, 2-Dichloropropane trans-1, 3-Dichloropropene 1, 1-Dichloroethane trans-1,2-Dichloroethene Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

# EXAMINATION OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE

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Analytical Serv REPORT Results by Sample

LAB # 84-08-180 Continued From Above

SAMPLE 1D RB-13-2, 115-120

FRACTION OZC TEST CODE GC 601 Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). **Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 8 RECEIVED: 08/17/84

Analytical Serv REPORT Results by Sample

SAMPLE	ID RB-13-	SAMPLE ID RB-13-3, 135-140		SAMPLE Date &	1 in	SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 08/16/84	S: A, B, C 08/16/8	0,4	Category	 	
CA_E	21	21 CL_IC	24 mg/L	CO3 A (1	<b>₽</b> C03	(1 FE	5.6 ug/m1	5. 6 HC03 A 105 MG E	105 1		15
M E	23	S04_IC	9 mg/L								

RECEIVED: 08/17/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-180

SAMPLE ID RB-13-3, 135-140

FRACTION 03C TEST CODE 6C 601
Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

엵 VERIFIED BY COMPOUNDS DETECTED XWX ANALYST INSTRUMENT DATE INJECTED 08/23/84 8 DATA FILE CONC

COMPOUND SCAN RESULT COMPOUND

SCAN

Trichloroethene Dibromochloromethane 1, 1, 2-Trichloroethane 윋 뮏 月 Chloromethane Bromome thane Vinyl Chloride

뮏

RESULT

Q

2-Chloroethylvinyl Ether

cis-1, 3-Dichloropropene

뮏

Bromoform

윋

1, 1, 2, 2-Tetrachloroethane

月

Tetrachloroethylene

S Chloroethane

윋 Methylene Chloride

Trichlorofluoromethane

뮏

뒫 1, 1-Dichloroethene

1, 1-Dichloroethane trans-1, 2-Dichloroethene

윋

윋

윋 Chloroform

윋 1, 2-Dichloroethane

1, 1, 1-Trichloroethane

2 뮏 Carbon Tetrachloride **Bromodichloromethane** 

뮏 1, 2-Dichloropropane 뮏

trans-1, 3-Dichloropropene

Chlorobenzen

2

윋 1, 2-Dichlorobenzene

1, 3-Dichlorobenzene

윋

1, 4-Dichlorobenzene

# KY KA KO I CA KA

PAGE 10 RECEIVED: 08/17/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-180 Continued From Above

SAMPLE ID RB-13-3, 135-140

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\sqrt{4}}{\sqrt{4}}$  unless otherwise specified. Not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 11 RECEIVED: 08/17/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-180

ו אשרוב ו	13-13-	SAMPLE ID RB-13-4, 195-200		SAMPLE #	지를	SAMPLE # 04 FRACTIONS: A, B, C, D Date & Time Collected 08/16/84	A, B, C. 8/16/8	0	Category	7.4	
CA_E	21 ug/m1	21 CL_IC_09/m1	24 mg/L	CO3 A <1	₩.	m'	26 ug/m1	26 HC03 A 91 MG E	91		12 (m/gn
NA E	29	S04_IC	9 mg/L								

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RECEIVED: 08/17/84

Analytical Serv Results by Sample

REPORT

LAB # 84-08-180

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SAMPLE ID RB-13-4, 195-200

VERIFIED BY COMPOUNDS DETECTED Category XMX B FRACTION 04C TEST CODE GC 601
Date & Time Collected 08/16/84 ANALYBT INSTRUMENT DATE INJECTED 08/27/84 DATA FILE CONC. FACTOR

윋 RESULT COMPOUND SCAN RESULT COMPOUND SCAN

Trichloroethene Dibromoch loromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 윋 밀 月 윋 Chloromethane Vinyl Chloride Chloroethane Bromomethane

2 Methylene Chloride

밀 **Trichlorofluoromethane** 

밁 윋 1, 1-Dichloroethene 1,1-Dichloroethane

trans-1, 2-Dichloroethene

윋

윋 Chloroform

뮏 뮏 1, 2-Dichloroethane 1, 1, 1-Trichloroethane

윋 윋 Carbon Tetrachloride Bromodichloromethane

1,2-Dichloropropane

2

뮏

trans-1, 3-Dichloropropens

NAME EPA Method 601/GC

980

月

얼

뮏 2-Chloroethylvinyl Ether 뮏 Bromoform

月

1, 1, 2, 2-Tetrachloroethane

뮏 Chlorobenzene **Tetrachloroethylene** 

뮏 1, 3-Dichlorobenzene

뮏

윋 1, 2-Dichlorobenzene

윋 1, 4-Dichlorobenzene

#### EZMOIMN

PAGE 13 RECEIVED: 08/17/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-180 Continued From Above

1.0

SAMPLE ID RB-13-4, 195-200

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/16/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND - not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in



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Analytical Serv REPORT NonReported Work

LAB # 84-08-180

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

CLECTARION

PAGE 1 RECEIVED: 08/28/84

Analytical Serv REPORT 09/10/84 20:23:31

LAB # 84-08-269

REPORT Radian	TO B1 4	Austin	or Sacramento	
REF				Ø

Radian Analytical Services	8501 MoPac Blvd.	P. O. Box 9948	Austin, Texas 78766		(512) 454-4797
PREPARED	B∀			ATTEN	PHONE

	Mrs.	
	120 / W	FIED BY
1	July	CERTIF

CONTACT CONDVER

please send one copy of the report to Toby Walters in Austin

SAMPLES 3

CLIENT MCCLELLAN AF COMPANY McClellan AFB FACILITY

					cover
Reconn Boring	8/27/84, WB	hand carried	H20	212-027-16	under separate cover
WORK ID R	TAKEN 8	TRANS h	TYPE H	P. O. # 2	INVOICE

Analytical Serv TEST CODES and NAMES used on this report ICPES

Chloride IC Calcium, CA E SAMPLE IDENTIFICATION RB-14-1, 80-85 RB-14-2, 120-130 RB-14-3, 180-200

의임임

EPA Method 601/GC Sodium, ICPES Bicarbonate Iron, ICPES Magnesium, Sulfate IC Carbonate GC 601 HCD3 A MG E NA E SO4 IC CO3 A FE E

PAGE 2 RECEIVED: 08/28/84

Analytical Serv REPORT Results by Sample

PLE 10 1	(B-14-	AMPLE 10 RB-14-1, 80-85		SAMPLE Date &	#	SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/27/84	S: A, B, C, 08/27/84	0	Category	7	
	20 / 81	טר זכ	25 mg/L	CO3 A (1 FE E	(1 cac03	<u>u</u>	4.8 ug/m1	4.8 HCO3 A 88 MG E	88 cac03	D E	16 ug/m1
	18/60	504_IC_	5 mg/L								

RECEIVED: 08/28/84 e d .

REPORT Results by Sample Analytical Serv

LAB # 84-08-269

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/27/84 SAMPLE ID RB-14-1, 80-85

COMPOUNDS DETECTED VERIFIED BY **ANALYST** INSTRUMENT DATE INJECTED 08/31/84 DATA FILE CONC. FACTOR

2 RESULT Trichloroethene Dibromochloromethane COMPOUND SCAN S 2 RESULT Chloromethane Bromomethane COMPOUND SCAN

cis-1, 3-Dichloropropene 밁 Vinyl Chloride

밁 일 Chloroethane Methylene Chloride

S 일 Trichlorofluoromethane 1, 1-Dichloroethene

윋 1, 1-Dichloroethane

밁 trans-1,2-Dichloroethene

2 밁 Chloroform 1, 2-Dichloroethane

2 1, 1. 1-Trichloroethane

밁 Carbon Tetrachloride

밁 1,2-Dichloropropane

Bromodichloromethane

밁

윋 trans-1, 3-Dichloropropene

1, 1, 2-Trichloroethane

2

2

밁 2-Chloroethylvinyl Ether

9 Bromoform

S Tetrachloroethylene

밁

1, 1, 2, 2-Tetrachloroethane

2 Chlorobenzene

밁 1, 3-Dichlorobenzene

밁 1, 4-Dichlorobenzene

1, 2-Dichlorobenzene

S

RECEIVED: 08/28/84

Analytical Serv Results by Sample

REPORT

LAB # 84-08-269 Continued From Above

SAMPLE ID RB-14-1, 80-85

FRACTION OIC TEST CODE GC 601
Date & Time Collected 08/27/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in <u>ug/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79).

#1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute.

Comments

PAGE 5 RECEIVED: 08/28/84

Analytical Serv REPORT Results by Sample

			15	1 1 20 20		
		Category	11 HCO3 A 88 MG E			
		4	HCO3_A			
	INS: A, B, C	Date & Time Collected 08/27/84	11	1		
- L	FRACTIC	Collecte	(1 FE E			
	1PLE # 02	e & Time	C03_A <1	ds catus		
	SAV	Dat	C03_A	1/5W		
			21	⊜g⁄r	ı,	mg/L
	, 120-130		18 CL_IC_		18 SO4 IC	
	SAMPLE ID RB-14-2, 120-130		81	1 W / B n	81	ug/ml
יורפרו אנה. ממו במו מי	SAMPLE		CA_E		I'M E	

PAGE 6 RECEIVED: 08/28/84

Analytical Serv REPORT Results by Sample

ئنا
) 03(
FRACTION 02C
120-130
SAMPLE ID RB-14-2,
1

II NAME EPA Method 601/GC Category	VERIFIED BY JSG A COMPOUNDS DETECTED O	COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1, 1, 2, 2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1, 3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1,4-Dichlorobenzene ND				
TEST CODE GC 601 lected 08/27/84	ANALYST INSTRUMENT	SCAN					•		1,									
FRACTION 02C TEST CODE GC 6 Date & Time Collected 08/27/84	DATE INJECTED 08/31/84	COMPOUND RESULT	Chloromethane ND (	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1,1-Dichloroethane ND	Dichloroethene ND	Chloroform ND	1,2-Dichloroethane ND	1,1,1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	trans-1,3-Dichloropropene ND
-2, 120-130	₩	COMP					Meth	Trichlor	1,1-	1,1-	trans-1,2-Dichlor		1, 2-	1,1,1-1	Carbon	Bromod	1,2-0	trans-1,3-D
SAMPLE ID RB-14-2, 120-130	DATA FILE CONC. FACTOR	SCAN							1									1

CONTRACTOR

RECEIVED: 08/28/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-269 Continued From Above

SAMPLE ID RB-14-2, 120-130

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/27/84

Category

NAME EPA Method 601/GC

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. uq/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

PAGE 8 RECEIVED: 08/28/84

Analytical Serv REPORT Results by Sample

	) RB-14-3	SAMPLE ID RB-14-3, 180-200		SAMPLE	ල ##	SAMPLE # 03 FRACTIONS: A, B, C, D	A, B, C,	0		
				Date &	Time	Collected (	08/27/84		Category	
CA_E	21 C	OL_10	21	CO3 A (1	1) ac03	ען ען	14	HC03 A 103 MG E	103 M(	19/00/01
A m	18	S04_IC	1/6w	•						

RECEIVED: 08/28/84

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REPORT Results by Sample Analytical Serv

LAB # 84-08-269

NAME EPA Method 601/GC Category TEST CODE GC 601 Date & Time Collected 08/27/84 FRACTION 03C SAMPLE ID RB-14-3, 180-200

980 2 呈 S 밁 呈 2 밁 욷 밁 2 S RESULT S COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether 1, 3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene 1, 2-Dichlorobenzene Dibromoch loromethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 08/31/84 Ω 윋 Q S ᄝ S 밁 S 욷 S S g N Q N RESULT Chloromethane Chloroform Vinyl Chloride Chloroethane Methylene Chloride 1, 2-Dichloroethane Carbon Tetrachloride Bromodichloromethane 1, 2-Dichloropropane Bromome thane Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane COMPOUND 8 DATA FILE CONC. FACTOR SCAN

2

trans-1, 3-Dichloropropene

RECEIVED: 08/28/84

Analytical Serv Results by Sample

REPORT

LAB # 84-08-269 Continued From Above

SAMPLE ID RB-14-3, 180-200

FRACTION 03C TEST CODE 6C 601 Date & Time Collected 08/27/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{\log L}{\log L}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 11 RECEIVED: 08/28/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601

01D 02D 03D

Analytical Serv REPORT NonReported Work

LAB # 84-08-269

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LAB # 84-08-217

Analytical Serv REPORT 09/05/84 09:28:26

RECEIVED: 08/22/84

please send one copy of the report to Toby Walters in Austin CONTACT CONDVER Note: Second column confirmation performed on Split OlC CERTIFIED BY Analytical Serv TEST CODES and NAMES used on this report Austin, Texas 78766 PREPARED Radian Analytical 8501 MoPac Blvd (512) 454-4797 P. O. Box 9948 PHONE В ATTEN SAMPLES under separate cover SAMPLE IDENTIFICATION Reconn Boring or Sacramento McClellan AFB MCCLELLAN AF Wayne Pearce hand carried 212-027-16 8/21/84 REPORT Radian Austin B1. 4 H20 WORK ID TAKEN TRANS TYPE INVOICE ATTEN COMPANY CLIENT FACILITY

EPA Method 601/GC

ron, ICPES

Carbonate

Calcium, ICPES

Chloride IC

CL IC CO3 A FE E

RB-15-2, 155-160

RB-15-2, 155-160 RB-15-3, 195-200

의임임의

RB-15-1, 115-120

Magnesium, ICPES

Bicarbonate

GC 601 HC03 A

MG E

Sodium, ICPES

Sulfate IC

NA E SO4 IC

#### NA PAINTENANT COMPANY

PAGE 3 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-217

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	21 01 01	סאוורכ זה עם-זט-זי זוט-זכט		Date & Time C	Time	Collected 08/21/84	08/21/84		Category	
CA E	42	42 CL_IC_	17	CO3 A <1	$\Box$	H	09	60 HC03 A 87	87 MG E	39
	ug/m]		mg/L	mg/L as C	ac03	ì	ug/ml	mg/L as	Caco3	lm/gu
NA E	28	S04 IC	8.9							
	ug/m1	1	mg/L							

### KY SALDINA KAN

RECEIVED: 08/22/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-217

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9<u>8</u>0 물 일 g S 呈 물 뮏 S 밁 2 2 2 RESULT . VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 4-Dichlorobenzene 2-Chloroethylvinyl Ether 1, 2-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND MCL FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/21/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 S S Ž 0.2 0.5 밁 일 2 2 Q Q 2 RESULT S 욷 Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane trans-1, 2-Dichloroethene Chloroform 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,1-Dichloroethene 1, 1-Dichloroethane 1,2-Dichloropropane COMPOUND SAMPLE ID RB-15-1, 115-120 DATA FILE CONC. FACTOR SCAN

S

trans-1, 3-Dichloropropene

#### KK LALDIAN Coaponation

PAGE 5 RECEIVED: 08/22/84

Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-217 Continued From Above

SAMPLE ID RB-15-1, 115-120

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/21/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. <u>ug/L</u> unless otherwise specified SCAN = scan number or retention time on chromatogram. All results reported in

#### COLPORATION COL

PAGE 6 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-217

Category SAMPLE # 02 FRACTIONS: B, C, D
Date & Time Collected 08/21/84 SAMPLE ID RB-15-2, 155-160

18 09/m1 17 NA E___ 13 MG E 20 / m1

CA E

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RECEIVED: 08/22/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-217

NAME EPA Method 601/GC

SAMPLE ID RB-15-2, 155-160 (2008)

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/21/84

JS6 밀 밁 밁 딝 S 밁 Q 밁 밁 RESULT N S 밁 VERIFIED BY COMPOUNDS DETECTED Trichloroethene 1, 4-Dichlorobenzene 2-Chloroethylvinyl Ether Bromoform 1, 3-Dichlorobenzene 1,2-Dichlorobenzenc Chlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 밁 2 밁 밁 윋 밁 0.5 S 밁 S N N 밁 S 0.5 S 밁 RESULT Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethane trans-1,2-Dichloroethene Chloroform 1, 1, 1-Trichloroethane Carbon Tetrachloride trans-1, 3-Dichloropropene 1, 1-Dichloroethene 1,2-Dichloroethane Bromodichloromethane 1,2-Dichloropropane COMPOUND DATA FILE CONC. FACTOR SCAN

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PAGE 8 RECEIVED: 08/22/84

Analytical Serv Results by Sample

REPORT Samble

LAB # 84-08-217 Continued From Above

SAMPLE ID RB-15-2, 155-160 (Lange)

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/21/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2—tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

LAB # 84-08-217

Category	
FRACTIONS: A Collected <u>08/21/84</u>	504_IC1.6
SAMPLE # 02 Date & Time (	HCO3 A 98
-2, 155-160	CO3 A <1 mg/L as caco3
SAMPLE ID RB-15-	CL_IC

SAMPLE	ID RB-15-	SAMPLE ID RB-15-3, 195-200		SAMPLE # Date & Ti	03 E	SAMPLE # 03 FRACTIONS: A, B, C, D Date & Time Collected 08/21/84	. A, B, C 08/21/8	4	Category	
CA_E	21 ug/m1	2I_10	16 mg/L	CO3 A <1		<u></u>	27 ug/m1	HCO3 A mg/L as	27 HC03 A 88 MG E	20 ug/m1
NA E	21	S04 1C	3.7							
<b> </b> 	ug/ml		mg/L							

#### CX ALCOHOLOGICAL CONTROL

VERIFIED BY COMPOUNDS DETECTED Trichloroethene 2-Chloroethylvinyl Ether Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene LAB # 84-08-217 Category COMPOUND FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/21/84 ANALYST INSTRUMENT SCAN Serv REPORT Results by Sample DATE INJECTED 08/27/84 S 2 S 윋 일 밁 욷 밀 2 밁 밁 2 N 2 윋 S RESULT Analytical Serv Chloromethane Vinyl Chloride 1,2-Dichloroethane trans-1, 3-Dichloropropene Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethane Chloroform 1, 1-Dichloroethene trans-1,2-Dichloroethene 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane COMPOUND SAMPLE ID RB-15-3, 195-200 RECEIVED: 08/22/84 DATA FILE CONC. FACTOR SCAN

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PAGE 11 RECEIVED: 08/22/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-217 Continued From Above

SAMPLE ID RB-15-3, 195-200

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/21/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

EVEL EDWARD

Analytical Serv

Serv REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE PAGE 12 RECEIVED: 08/22/84

DUP 601 DUP 601 DUP 601 01D 02D 03D

LAB # 84-08-217

#### CLASCOLATION CONTRACTOR

LAB # 84-08-130

REPORT

please send one copy of the report to Toby Walters in Austin CONTACT CONDVER Note: Second column confirmation performed on Split 03C CERTIFIED BY Analytical Serv TEST CODES and NAMES used on this report PREPARED Radian Analytical Services Austin, Texas 78766 8501 MoPac Blvd (512) 454-4797 P. O. Box 9948 Analytical Serv 09/05/84 07:27:38 EPA Method 601/GC Magnesium, ICPES Calcium, ICPES Sodium, ICPES Iron, ICPES Bicarbonate Chloride IC Carbonate B≺ PHONE ATTEN MG E NA E SO4 IC HCO3 A C03 A GC 601 FE E SAMPLES under separate cover SAMPLE IDENTIFICATION or Sacramento McClellan AFB Boring Wayne Pearce MCCLELLAN AF hand carried 212-027-16 RECEIVED: 08/13/84 RB-16-1, 90-100 TAKEN 8/10/84 120 Austin RB-16-3, 160 RB-16-4, 180 REPORT Radian Recon. 4 H20 RB-16-2, TYPE 0 TRANS ATTEN COMPANY WORK ID INVOICE CLIENT FACILITY P. O. # 임임임의

Sulfate IC

#### COMPCHANCON

PAGE 3 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-130

SAMPLE	SAMPLE ID RB-16-1, 90-100	, 90-100		SAMPLE Date &	Time (	SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/10/84	A, B, C, 08/10/84		Category	
CA E	51	כר וכ	14 mg/L	CO3 A <1 FE E	(1 3CO3	H H	70 H	HCO3 A 80 MG E	80 MG	E 52
NA_E	I	S04_IC	9.5 mg/L			Į.				

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PAGE 4 RECEIVED: 08/13/84

Analytical Serv

LAB # 84-08-130

NAME EPA Method 601/GC

SAMPLE ID RB-16-1, 90-100

Results by Sample

8 2 S 밁 RESULT 밁 S 밁 밁 밁 밁 Ž S 밁 COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 4-Dichlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2-Trichloroethane Category COMPOUND FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/10/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/22/84 윋 2 밁 2 뮏 뮏 밁 밁 Š 밁 윋 2 RESULT Chloromethane **Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane Chloroform trans-1,2-Dichloroethene 1,2-Dichloroethane 1, 1, 1—Trichloroethane Carbon Tetrachloride COMPOUND ⋖ DATA FILE NC. FACTOR SCAN CONC

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Bromodichloromethane

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1, 2-Dichloropropane

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trans-1, 3-Dichloropropene

#### KINDIMN CORPORATION

PAGE 5 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-130 Continued From Above

NAME EPA Method 601/GC

Category

SAMPLE ID RB-16-1, 90-100

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/10/84

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2~trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

#### WALDIAN COMPONDATION

PAGE 6 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-130

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	11 ug/m1	
gory	MGE	
Category	80 cacd3	
, D, E	HCO3 A 80 MG E mg/L as caco3	
NS: A, B, C d 08/10/8	3.7 ug/m1	
SAMPLE # 02 FRACTIONS: A, B, C, D, E Date & Time Collected 08/10/84	u,	
PLE # 02 e & Time	CO3 A (1	
SAM	C03 A	
	14 mg/L	5 mg/L
2, 120	CL_IC	S04_IC
SAMPLE ID <u>RB-16-2, 120</u>	18	26 ug/m1
SAMPLE	CA_E	₩ ₩

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RECEIVED: 08/13/84

Analytical Serv Results by Sample

REPORT

LAB # 84-08-130

1.

NAME EPA Method 601/GC TEST CODE GC 601 FRACTION O2C TEST CODE GC 60 Date & Time Collected 08/10/84 SAMPLE ID RB-16-2, 120

Category

RESULT

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VERIFIED BY COMPOUNDS DETECTED 도 B ANALYST INSTRUMENT SCAN DATE INJECTED 08/22/84 RESULT COMPOUND DATA FILE CONC. FACTOR SCAN

밁

Chloromethane

일

Bromomethane

S

Vinyl Chloride

S

Chloroethane

S

Methylene Chloride

윋

Trichlorofluoromethane

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1, 1-Dichloroethene

일

1, 1-Dichloroethane

S

trans-1, 2-Dichloroethene

N

Chloroform

밁

1,2-Dichloroethane

Trichloroethene COMPOUND

Dibromochloromethane

S 1, 1, 2-Trichloroethane

밁 cis-1, 3-Dichloropropene

S 2-Chloroethylvinyl Ether

윋

Bromoform

Ñ 1, 1, 2, 2-Tetrachloroethane

밁 Tetrachloroethylene 윋 Chlorobenzene

밁 1, 3-Dichlorobenzene

밁 1, 2-Dichlorobenzene 윋 1, 4-Dichlorobenzene

S S 1, 1, 1-Trichloroethane Carbon Tetrachloride

윋 1,2-Dichloropropane

Bromodichloromethane

일

밁 trans-1, 3-Dichloropropene

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RECEIVED: 08/13/84 PAGE 8

Analytical Serv REPUM Results by Sample

REPORT

LAB # 84-08-130 Continued From Above

SAMPLE ID RB-16-2, 120

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in  $\frac{100L}{1000}$  unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 9 RECEIVED: 08/13/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-130

	SAMPLE ID KB-16-3, 160		Date &	3 = 3	Date & Time Collected 08/10/84	08/10/8/		Category	
13(	130 CL_IC_	13 mg/L	CO3 A (1	(1 Cac03	u,	54 ug/m1	54 HCO3 A 89 MG E	89 MG	E 130
25 UB/BD	25 S04 IC	3 mg/L							

#### LY AND MAKE

PAGE 10 RECEIVED: 08/13/84

LAB # 84-08-130

NAME EPA Method 601/GC Category FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/10/84 Analytical Serv REPORT Results by Sample SAMPLE 10 RB-16-3, 160

			בסיסד יחוד בסיסד המיחים מסיסד מסיסד	0/01/00 0001		h inhanna	
DATA FILE CONC. FACTOR	B	DATE INJECTED	D <u>08/22/84</u>	ANALYST INSTRUMENT	KWK	VERIFIED BY COMPOUNDS DETECTED	BY JSG ED 0
SCAN	COM	COMPOUND	RESULT	SCAN	))	COMPOUND	RESULT
		Chloromethane	a ND			Trichloroethene	QN
		Bromomethane	QN .		Dibromo	Dibromochloromethane * _	ΩN
		Vinyl Chloride	a ND		1, 1, 2-Tr	1,1,2-Trichloroethane * _	QN
		Chloroethane	N N		cis-1, 3-Di	cis-1,3-Dichloropropene * _	QN
	Met	Methylene Chloride	Q N	-	2-Chloro	2-Chloroethylvinyl Ether _	QN
	Trichlo	Trichlorofluoromethane	ND			Bromoform _	QN
	1, 1	1, 1-Dichloroethene	υ N N N N N N N N N N N N N N N N N N N		., 1, 2, 2-Tetr	1,1,2,2-Tetrachloroethane #	Q
	1,1	1, 1-Dichloroethane	N N		Tetrac	Tetrachloroethylene #	QN
	trans-1, 2	trans-1,2-Dichloroethene	υ N N	İ		Chlorobenzene _	ND
		Chloroform	Q		1,3	1,3-Dichlorobenzene	QN
	1,2	1,2-Dichloroethane	Q N		1,5	1, 2-Dichlorobenzene	N
	1, 1, 1-	1,1,1-Trichloroethane	Q N		1,4	1, 4-Dichlorobenzene	ΩN
	Carbo	Carbon Tetrachloride	υ QN				
	Вгомо	Bromodichloromethane	Q N				
	1,2-	1,2-Dichloropropane	ON a				

<u>N</u>

trans-1,3-Dichloropropene

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RECEIVED: 08/13/84

Results by Sample Analytical Serv

LAB # 84-08-130 Continued From Above

SAMPLE ID RB-16-3, 160

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/10/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

LAB # 84-08-130

SAMPLE	SAMPLE ID RB-16-4, 180	-4, 180		SAMPLE # 04 FRACTIONS: A, B, C, D	4 FRACTIO	NS: A, B, C,	0	Catenorii	
A A	2	)! []	<u></u>	CO3 A	FF F	6 8	HCD3 A	93 MG F	5
	ug/m1		T/6w	mg/L as CaCO3	1 1 -	ug/m1	mg/L as	ug/ml mg/L as CaCO3	ug/m1
NA E	18	S04 IC	C 5						• • •
	ug/ml	)	mg/L						••

## KK M DOIME

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PAGE 13 RECEIVED: 08/13/84

Analytical Serv

LAB # 84-08-130

NAME EPA Method 601/GC Category FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/10/84 Serv REPORT Results by Sample SAMPLE ID RB-16-4, 180

VERIFIED BY COMPOUNDS DETECTED 지 조 교 ANALYST INSTRUMENT SCAN DATE INJECTED 08/22/84 RESULT COMPOUND DATA FILE CONC. FACTOR

2 RESULT Trichloroethene Dibromochloromethane 1, 1, 2-Trichloroethane COMPOUND S S Q **Chloromethane** Vinyl Chloride Bromomethane SCAN

2 윋 Chloroethane Methylene Chloride

2 Trichlorofluoromethane

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2-Chloroethylvinyl Ether

cis-1, 3-Dichloropropene

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Bromoform

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Tetrachloroethylene

1, 1, 2, 2-Tetrachloroethane

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1, 3-Dichlorobenzene

윋

Chlorobenzene

2

1, 2-Dichlorobenzene

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1, 4-Dichlorobenzene

N 1, 1-Dichloroethene

밁 1, 1-Dichloroethane

S trans-1, 2-Dichloroethene

밁 Ω Chloroform 1,2~Dichloroethane

밁 1, 1, 1-Trichloroethane

Ž Carbon Tetrachloride

밁 Bromodichloromethane

1,2-Dichloropropane

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trans-1, 3-Dichloropropene

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Analytical Serv REPORT Results by Sample

LAB # 84-08-130 Continued From Above

SAMPLE ID RB-16-4, 180

NAME EPA Method 601/GC Category

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/10/84

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropene co-elute. All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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PAGE 15 RECEIVED: 08/13/84

Analytical Serv REPORT NonReported Work

LAB # 84-08-130

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

OZE ! LOG_IN DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

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PAGE 1 RECEIVED: 08/30/84

Analytical Serv REPORT 09/26/84 11:53:35

LAB # 84-08-288

IT Radian	TO B1 4	Austin	or Sacramento	N Wayne Pearce
REPORT	F			ATTEN

1 Services			3766		
Radian Analytical Services	8501 MoPac Blvd.	P. O. Box 9948	Austin, Texas 78766		7974-454-6797
REPARED	BY			ATTEN	שמטחם

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CONTACT CONDVER

SAMPLES 3

COMPANY McClellan AFB FACILITY

CLIENT MCCLELLAN AF

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please send one copy of the report to Toby Walters in Austin

	@ Indicates that spike recovery for this analysis on the	
	specific matrix was not within acceptable limits indicating	
ı	an interferent present.	

SAMPLE IDENTIFICATION

, 115-120	35-140	180-190
R3-17-1, 1	RB-17-2, 1	RB-17-3, 1
01 RE	02 RE	

Analytical Serv TEST CODES and NAMES used on this report EPA Method 601/GC Calcium, ICPES Iron, ICPES Chloride IC Bicarbonate Carbonate MG E NA E SO4 IC HCD3 A GC 601 CO3 A FE E

Magnesium, ICPES Sodium, ICPES

Sulfate IC

SE 23	Analu	Analutical Serv	REPORT	LAB # 84-08-288
RECEIVED: 08/30/84	•	RESULTS BY TEST	TEST	
	RB-17-1	88-17-2	RB-17-3	
TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03	
u (N	⊶ ∞i	, 00	ဗ	
	16	91	50	
! ! 	O	7	₽	
	rú	cui	9 %	
HCO3_A	112	96	95	
	6.3	6. 1	6.1	
NA S	7.7	7.6	7.4	
204 IC	uro.	cu o~	6.7	

PAGE 3 RECEIVED: 08/30/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-288

NAME EPA Method 601/60 Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/29/84 SAMPLE ID RB-17-1, 115-120

COMPOUNDS DETECTED 136	RESULT
COMPC	COMPOUND
ACL.	Ū
ANALYSI	SCAN
INJECTED 09/24/84	RESULT
DATE	COMPOUND
CONC. FACTOR	SCAN

					1
SCAN	COMPOUND	RESULT	SCAN	COMPOUND	RESULT
	Chloromethane	Q		Trichloroethene	ND
	Bromomethane	Q		Dibromochloromethane *	Q
	Vinyl Chloride	Q		1, 1, 2-Trichloroethane *	N
	Chloroethane	Q		cis-1,3-Dichloropropene *	QN
1	Methylene Chloride	1.7		2-Chloroethylvinyl Ether	Q
	Trichlorofluoromethane	Q		Bromoform	N
	1, 1-Dichloroethene	Q		1, 1, 2, 2-Tetrachloroethane #	N
	1, 1-Dichloroethane	QN		Tetrachloroethylene #	S
	trans-1,2-Dichloroethene	Q		Chlorobenzene	N
	Chloroform	QN		1, 3-Dichlorobenzene	Z
	1,2-Dichloroethane	Q		1,2-Dichlorobenzene	N
	1, 1, 1—Trichloroethane	Q		1, 4-Dichlorobenzene	S
	Carbon Tetrachloride	QN			

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Bromodichloromethane

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1, 2-Dichloropropane

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trans-1, 3-Dichloropropene

CORPORATION

PAGE 4 RECEIVED: 08/30/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-288 Continued From Above

[51

SAMPLE ID RB-17-1, 115-120

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

	08/30/84
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PAGE	RECEI

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-288

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SAMPLE ID RB-17-2, 135-140

NAME EPA Method 601/60 FRACTION O2C TEST CODE GC 601 Date % Time Collected 08/29/84

989 일 2 밁 밁 일 밁 S 2 밁 2 일 일 RESULT VERIFIED BY COMPOUNDS DETECTED Bromoform Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Tetrachloroethylene cis-1, 3-Dichlarapropene 1, 1, 2, 2-Tetrachloroethane Dibromoch loromethane 1, 1, 2-Trichloroethane Category COMPOUND RAA ANALYST INSTRUMENT SCAN DATE INJECTED 09/24/84 윋 밁 일 밀 윋 밀 윋 ᄝ 밁 밁 밁 밁 밁 g 물 RESULT Chloromethane Vinyl Chloride Chloroform **Bromomethane** Chloroethane Methylene Chloride 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene Carbon Tetrachloride trans-1, 3-Dichloropropene Trichlorofluoromethane 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Bromodichloromethane 1,2-Dichloropropane COMPOUND DATA FILE SCAN

CORPORATION

PAGE 6 RECEIVED: 08/30/84

Analytical Serv RePORT Results by Sample

LAB # 84-08-288 Continued From Above

SAMPLE ID RB-17-2, 135-140

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{19/L}{1000}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

RECEIVED: 08/30/84

REPORT Analytical Serv Results by Sample

LAB # 84-08-288

NAME EPA Method 601/GC

SAMPLE ID RB-17-3, 180-190

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/30/84

989 밁 밁 2 RESULT VERIFIED BY COMPOUNDS DETECTED Trichloroethene Dibromochloromethane Category COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 09/05/84 S S RESULT Chloromethane Bromomethane COMPOUND DATA FILE CONC. FACTOR SCAN

2-Chloroethylvinyl Ether 1, 1, 2-Irichloroethane cis-1, 3-Dichloropropene 밁 밁 일 Vinyl Chloride Chloroethane Methylene Chloride

밁

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Bromoform

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Tetrachloroethylene

2

1, 1, 2, 2-Tetrachloroethane

밁

Chlorobenzene

2

1, 3-Dichlorobenzene

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일 2 Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane

밁 trans-1, 2-Dichloroethene

ᄝ

呈 Chloroform

9 1, 1, 1-Trichloroethane

밁

1, 2-Dichloroethane

2

1, 4-Dichlorobenzene

밀

1, 2-Dichlorobenzene

밁 Carbon Tetrachloride

밁 1,2-Dichloropropane

밁

trans-1, 3-Dichloropropene

밁 **Bromodichloromethane**

CORPORATION

PAGE 8 RECEIVED: 08/30/84

Analytical Serv Results by Sample

LAB # 84-08-288 Continued From Above

SAMPLE ID RB-17-3, 180-190

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/30/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 9 RECEIVED: 08/30/84

Analytical Serv REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

specific matrix was not within acceptable limits indicating please send one copy of the report to Toby Walters in Austin * Indicates a value less than 5 times the detection limit @ Indicates that spike recovery for this analysis on the 2nd column confirmation performed on EPA 601 which must be interpreted accordingly PREPARED <u>Radian Analytical Services</u>
BY <u>8501 MoPac Blvd.</u> Austin, Texas 78766 an interferent present (512) 454-4797 Analytical Serv REPORT 09/26/84 10:21:42 P O. Box 9948 PHONE ATTEN SAMPLES under separate cover Reconn Boring or Sacramento McClellan AFB hand carried Wayne Pearce MCCLELLAN AF 212-027-16 RECEIVED: 09/04/84 8/31/84 Radian Bl 4 Austin H20 REPORT TO WORK ID TRANS ATTEN COMPANY TAKEN TYPE INVOICE CLIENT FACILITY PAGE

CONTACT CONDVER

CERTIFIED BY

LAB # 84-09-011

Analytical Serv TEST CODES and NAMES used on this report EPA Method 601/GC Magnesium, ICPES Calcium, ICPES Sodium, ICPES Bicarbonate Chloride IC Iron, ICPES Sulfate IC Carbonate HCO3 A NA E SO4 IC CO3 A FE E GC 601

SAMPLE IDENTIFICATION

R3-18-1, 120-140

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PAGE 2 RECEIVED: 09/04/84

Analytical Serv REPORT RESULTS BY TEST

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	LEST CODE	Sample 01	
	default units	(entered units)	
Caco3			
E	 C.Þ.	61	
Caco3	: 0g/m1		••
Caco3	ין נר	17	
E	: mg/L		
Caco3 60 60 60 60 60 60 60 60 60 60 60 60 60	1 C03 A		
Cac03	: mg/L as CaCO3		••
Cac03	ليا ليا سا	56	
2	: ug/ml		••
E000e0	HC03 A		
	mg/L_as CaCO3		
	س چو	223	
	; ug/ml		••
504 IC	— ₩	¥7.	
S04 IC	: ug/ml		
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	1 mg/L		

PAGE 3 RECEIVED: 09/04/84

Analytical Serv Results by Sample

LAB # 84-09-011

SAMPLE ID RB-18-1, 120-140

NAME EPA Method 601/60 FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/31/84

786 9 S 물 밁 9 밁 일 RESULT 밁 g 2 닐 2 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzeire 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Dibromoch loromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene** Category COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 09/07/84 S 밁 S 밁 밁 밁 2 밁 밁 2 QN. 밁 일 밁 ᄝ RESULT Chloromethane Methylene Chloride Chloroform Bromomethane Vinyl Chloride Chloroethane Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride 1,2-Dichloropropane trans-1, 3-Dichloropropene Bromodich loromethane COMPOUND DATA FILE CONC. FACTOR SCAN

PAGE 4 RECEIVED: 09/04/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-011 Continued From Above

SAMPLE ID RB-18-1, 120-140

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/31/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in $\frac{\log L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 5 RECEIVED: 09/04/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

Analytical Serv REPORT NonReported Work

LAB # 84-09-011

01D : DUP601

please send one copy of the report to Toby Walters in Austin CONTACT CONDVER Services Austin, Texas 78766 PREPARED Radian Analytical 8501 MoPac Blvd (512) 454-4797 P. O. Box 9948 Analytical Serv REPORT 09/10/84 20:39:08 ATTEN PHONE В SAMPLES CLIENT MCCLELLAN AF WORK ID <u>Reconn Boring</u> TAKEN <u>8/28/84</u> or Sacramento ATTEN Wayne Pearce RECEIVED: 08/29/84 Austin REPORT Radian FACILITY

LAB # 84-08-281

PAGE

SAMPLE IDENTIFICATION	Analytica	Analytical Serv TEST CODES and NAMES used on this repor	and NAMES	used	9	his	repor
RB-19-1, 120	CA E Ca	lcium, ICPES					
RB-19-2, 140	CL IC Ch	loride IC					
RB-19-3, 180	CO3 A Car	rbonate					
RB-19-4, 200	FE E Ir	on, ICPES	!				
	GC 601 EP	A Method 601/GC					
	HCO3 A Bio	carbonate					
	MG E Ma	inesium, ICPES	· .				
	NA E So	dium, ICPES					
	S04 IC Su	Ifate IC					

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TRANS hand carried TYPE H20 P 0 # 212-027-16

PAGE 2 RECEIVED: 08/29/84

Analytical Serv REPORT Results by Sample

		SAMPLE ID RB-19-1, 120		SAMPLE # 01	1 #	FRACTIONS	3: A, B, C	Ω′		
-				Date &	Time	Collected not specified	not spe	cified	Category	
CA_E	2	21 CL_IC	23	CO3_A <1		FE		HC03 A 108 MG E	108 M	13
6 0	/m1		mg/L	mg/Las (3aC03		ug/ml	mg/L as	CaCO3	ug/ml
NA E	19	S04 IC	5							
5 0	1/m1		mg/L							

PAGE 3 RECEIVED: 08/29/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-281

SAMPLE ID RB-19-1, 120

FRACTION OIC TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Category

DATA FILE CONC. FACTOR	A DATE INJECTED <u>06/31/84</u>	ANALYST INSTRUMENT	VERIFIED BY JSG COMPOUNDS DETECTED O
SCAN	COMPOUND RESULT	SCAN	COMPOUND
	Chloromethane ND :		Trichloroethene ND
-	Bromomethane ND		Dibromochloromethane * ND
	Vinyl Chloride ND		1,1,2-Trichloroethane * ND
	Chloroethane ND :		cis-1,3-Dichloropropene * ND
	Methylene Chloride ND		2-Chloroethylvinyl Ether ND
	Trichlorofluoromethane ND		Bromoform ND
	1,1-Dichloroethene ND		1,1,2,2-Tetrachloroethane # ND
	1,1-Dichloroethane ND		Tetrachloroethylene # ND
	trans-1,2-Dichloroethene ND :		Chlorobenzene ND
	Chloroform ND		1,3-Dichlorobenzene ND
	1,2-Dichloroethane ND		1,2-Dichlorobenzene ND
	1,1,1-Trichloroethane ND		1,4-Dichlorobenzene ND
	Carbon Tetrachloride ND		
	Bromodichloromethane ND		
	1, 2-Dichloropropane ND		
	trans-1, 3-Dichloropropene ND		

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REPORT Results by Sample Analytical Serv

LAB # 84-08-281 Continued From Above

SAMPLE ID RB-19-1, 120

FRACTION OIC TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT

◆Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{\log L}{L}$ unless otherwise specified. NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

SAMPLE	SAMPLE ID RB-19-2, 140	.2, 140		SAMPLE	8	SAMPLE # 02 FRACTIONS: A, B, C, D	A, B, C.	0		
				Date &	1 me	Collected	not spe	cified	Category	
CA E	21	21 CL IC	17	C03 A <1		ш	22 H	HCO3 A	HC03 A 96 MG E	17
	Ug/m1		mg/L	mg/L as Ca	ac03		ug/ml	mg/L as	CaC03	ug/ml
NA E	21 S	S04 IC	m							
1	ug/m1	l	mg/L							

Complementation

PAGE 6 RECEIVED: 08/29/84

Results by Sample Analytical Serv

LAB # 84-08-281

SAMPLE ID RB-19-2, 140

FRACTION O2C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified

JSG 밁 밁 밁 일 밁 N 밁 밁 S RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene Bromoform 1, 2-Dichlorobenzene 1,4-Dichlorobenzene cis-1, 3-Dichloropropene Dibromochloromethane 1, 1, 2-Trichloroethane 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND X B ANALYST INSTRUMENT SCAN DATE INJECTED 08/31/84 S Q S Q S S 밁 밁 2 RESULT S 밁 일 밁 밁 Chloromethane Chloroform **Bromomethane** Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1,2-Dichloroethane Carbon Tetrachloride Bromodichloromethane Trichlorofluoromethane 1, 1, 1-Trichloroethane 1,2-Dichloropropane trans-1, 3-Dichloropropene COMPOUND 8 DATA FILE FACTOR SCAN

Analytical Serv PAGE 7 RECEIVED: 08/29/84

REPORT Results by Sample

LAB # 84-08-281 Continued From Above

SAMPLE ID RB-19-2, 140

FRACTION O2C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Category

Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in_

PAGE 8 RECEIVED: 08/29/84

Analytical Serv REPURI Results by Sample

ALL L	SAMPLE ID KB-19-3, 180	3, 180		CAMPL	1 	PKAC I I	5. A. 5. C.) U		
				Date (k Time	Collecte	Date & Time Collected not specified	cified	Category	
CA_E		CL_IC	12	CO3 A (1 FE E				HCO3 A	1.5 HC03 A 103 MG E	12
	rø/bn		my/L	(B) 1 / 6 III				l D	; ; ;	
A E	16	S04 IC	(,)							
	ug/m1		mg/L							

CORPOMENTS

LAB # 84-08-281

3

FRACTION 03C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Analytical Serv REPORT Results by Sample SAMPLE ID RB-19-3, 190 RECEIVED: 08/29/84

086 RESULT COMPOUNDS DETECTED VERIFIED Category COMPOUND X D ANALYST INSTRUMENT SCAN DATE INJECTED 08/31/84 RESULT COMPOUND 8 DATA FILE NC FACTUR SCAN CONC

밁 Chloromethane

S 2 Bromomethane Vinyl Chloride

2 Chloroethane

밁 Methylene Chloride S Q Trichlorofluoromethane 1, 1-Dichloroethene

일 1, 1-Dichloroethane

S trans-1, 2-Dichloroethene

2 Chloroform

1, 2-Dichloroethane

S

밁 1, 1, 1-Trichloroethane

Carbon Tetrachloride 윋 밁 1,2-Dichloropropane

Bromodichloromethane

일

trans-1, 3-Dichloropropene

Trichloroethene

S

g

Dibromochloromethane

밁 1, 1, 2-Trichloroethane

2 cis-1, 3-Dichloropropene

밁 2-Chloroethylvinyl Ether 밁

Bromoform

밁 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene

일 Chlorobenzene 밁 1, 3-Dichlorobenzene

S 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene

RECEIVED: 08/29/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-281 Continued From Above

SAMPLE ID RB-19-3, 180

FRACTION 03C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

SAMPLE	SAMPLE ID RB-19-4, 200	4, 200		SAMPLE	40	FRACTIONS	. A, B, C	0'			
				Date &	Time	Date & Time Collected not specified	not spe	cified	Category	2	
CA E	17	OL IC	10	C03_A <1 FE_E			3.7	3.7 HCB3 A 110 MG E	110	Ť E	11
	ug/m]		mg/L	mg/L as C	ac03		ug/ml	mg/L as	CaCO3		ug/ml
NA E	17	S04 IC	CJ								
	ug/ml	1	mg/L								

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RECEIVED: 08/29/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-281

SAMPLE ID RB-19-4, 200

FRACTION 04C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified Category

Category

RESULT COMPOUNDS DETECTED VERIFIED BY COMPOUND INSTRUMENT ANALYST SCAN DATE INJECTED 08/31/84 RESULT COMPOUND DATA FILE CONC. FACTOR SCAN

Trichloroethene Chloromethane

S Bromomethane

g

Vinyl Chloride

S

Chloroethane

S

Methylene Chloride

S

Trichlorofluoromethane

밁

1, 1-Dichloroethene

Z

1,1-Dichloroethane

1, 1, 2-Trichloroethane

Dibromochloromethane

Q

2

2

cis-1, 3-Dichloropropene

윋 2-Chloroethylvinyl Ether

밁 Bromoform

Ñ 1, 1, 2, 2-Tetrachloroethane

2 Tetrachloroethylene

밁 Chlorobenzene

일

trans-1, 2-Dichloroethene

밁

Chloroform

2

1,2-Dichloroethane

S 1, 3-Dichlorobenzene S 1, 2-Dichlorobenzene

ᄝ 1, 4-Dichlorobenzene

> Q Z **Bromodichloromethane**

Carbon Tetrachloride

밁

Q V

1, 1, 1-Trichloroethane

2 1, 2-Dichloropropane

밁 trans-1, 3-Dichlorupropene

RECEIVED: 08/29/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-281 Continued From Above

SAMPLE 1D RB-19-4, 200

FRACTION 04C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected not specified

Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram All results reported in $\frac{19/L}{L}$ unless otherwise spec

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Serv REPORT NonReported Work Analytical Serv

LAB # 84-08-281

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

PAGE 1 RECEIVED: 08/30/84

Analytical Serv REPORT 09/24/84 11:23:44

LAB # 84-08-287

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Radian	81 4	Austin	or Sacramento	Wayne Pearce
REPORT	10			ATTEN

SAMPLES 4

CLIENT MCCLELLAN AF COMPANY McClellan AFB FACILITY

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P. O. Box 9948

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WORK ID	TAKEN	TRANS	TYPE	# 0	INVOICE

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nger separate tover	THENITICIPATION
nger.	INCAIT
1000	CAMOL

AMPLE IDENTIFICATION	8-20-1, 140	RB-20-2, 160	B-20-3, 180	B-20-4, 200	
SAMPLE	RB-20-	RB-20-	RB-20-	RB-20-	
	0	05	03	04	

Chloride IC Carbonate
EPA Method 601/GC Bicarbonate Magnesium, ICPES Sodium, ICPES

PAGE 2 RECEIVED: 08/30/84

LAB # 84-08-287

Analytical Serv REPORT Results by Sample

•	MPLE 10 KB-20-1, 140	1, 140			5	FRACTIONS	Ç Ağ Ç	a			
				Date &	Line	Date & Time Collected 08/29/84	08/52/80		Category	7.4 	
CA CA FF	च)] [y6	C03 A (1 FE E		LL LL LL LL LL LL LL LL LL LL LL LL LL	ব	03 A		<u>ب</u>	10
	lm/gu	44	T/6w	mg/L as C.	ac03		ug/m1	se 7/6w	Cacoa		ug/m1
¥ ₩	10	S04 IC	44.								
<u> </u>	lm/gu		mg/L								

PAGE 3 RECEIVED: 08/30/84

REPORT Analytical Serv

Results by Sample

LAB # 84-08-287

586 2 2 2 ÿ 밀 욷 ÿ Q 9 g RESULT g 문 VERIFIED BY COMPOUNDS DETECTED Bromoform Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Category COMPOUND N E FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/29/84 ANAL YST INSTRUMENT SCAN DATE INJECTED 09/05/84 밀 S 2 윋 S 2 밁 밁 무 S 9 2 S S RESUL T Chloromethane Vinyl Chloride Chloroform Carbon Tetrachloride Bromomethane Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane **Bromodichloromethane** COMPOUND SAMPLE ID RB-20-1, 140 DATA FILE SCAN

皇

1, 2-Dichloropropane

밁

trans-1, 3-Dichloropropene

COMPUMANTA

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Analytical Serv Results by Sample

LAB # 84-08-287 Continued From Above

SAMPLE ID RB-20-1, 140

FRACTION OIC TEST CODE GC 601
Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in $\frac{\log L}{\log L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

		SAMPLE ID KB-20-2, 160		SAMPLE Date &	3 m	SAMPLE # 02 FRACTIONS: A, B, C, D Date & Time Collected 08/29/84	A, B, C 08/29/8	0	Category	
CA E	15.go	מר ונ	9.9 mg/L	CO3 A (1	E003	ייי	0.69	0.69 HC03 A 82	82 MG E	14 14 n
A W	10 10	S04_IC	200 mg/L							

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RECEIVED: 08/30/84

Serv REPORT Results by Sample Analytical Serv

LAB # 84-08-287

SAMPLE ID RB-20-2, 160

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category <u>ක</u> ක

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S

2

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2-Chloroethylvinyl Ether

cis-1,3-Dichloropropene

1, 1, 2-Trichloroethane

2

Bromoform

2

1, 1, 2, 2-Tetrachloroethane

2

Tetrachloroethylene

문

Chlorobenzene

RESULT COMPOUNDS DETECTED VERIFIED Trichloroethene Dibromoch loromethane COMPOUND **ANALYST** INSTRUMENT SCAN DATE INJECTED 09/05/84 밁 2 RESULT Chloromethane Bromomethane COMPOUND DATA FILE CONC. FACTOR SCAN

S Vinyl Chloride

Methylene Chloride

1, 1-Dichloroethane

일

trans-1, 2-Dichloroethene

2

2.4 1, 1, 1-Trichloroethane 물

1, 2-Dichloropropane

1, 4-Dichlorobenzene

밁 Bromodichloromethane

trans-1, 3-Dichloropropene

9

S

일

皇

Chloroethane

Trichlorofluoromethane

2

문

1, 1-Dichloroethene

Chloroform

1, 2-Dichloroethane

Carbon Tetrachloride

S

1, 2-Dichlorobenzene

S

문

1, 3-Dichlorobenzene

- Q

RECEIVED: 08/30/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-287 Continued From Above

SAMPLE ID RB-20-2, 160

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

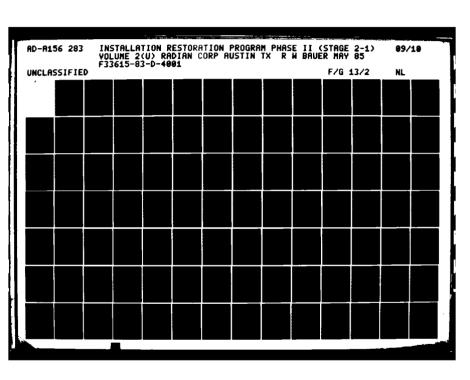
NOTES AND DEFINITIONS FOR THIS REPORT

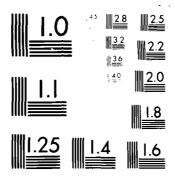
*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

AMPLE	AMPLE ID RB-20-3, 180	180		SAMPL	* # ₩ # # # # # # # # # # # # # # # # #	FRACIIUN Collected	SAMPLE # 03 FRACIIONS: A, B, C, D Date & Time Collected 08/29/84		Category	
m E	16	CL IC	9.5 mg/L	(03 A (1) mg/L as Caco3	Caco3	u.	15	HCO3 A	HCO3 A 92 MG E	13
H	9.6	S04_IC	55 mg/L							





MICROCOPY RESOLUTION TEST CHART NATIONAL HIGHER CONTROL OF TANK ARE CONTROL OF TH

PAGE 9 RECEIVED: 08/30/84

Results by Sample Analytical Serv

LAB # 84-08-287

SAMPLE ID RB-20-3, 180

500 VERIFIED BY NAME EPA Method 601/60 Category Š FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/29/84 **ANALYST** DATE INJECTED 09/05/84 DATA FILE

G G	2-Chloroethylvinyl Ether Bromoform		Q Q	Methylene Chloride Trichlorofluoromethane	<u> </u>	
2	cis-1,3-Dichloropropene *		Q	Chloroethane	1	
S	1, 1, 2-Trichloroethane *		Q	Vingl Chloride		
S.	Ditromochloromethane *		9	Bromomethane		
S	Trichloroethene	}	Q	Chloromethane		
RESULT	COMPOUND	SCAN	RESULT	COMPOUND	SCAN	
	T COMPOUNDS DETECTED	INSTRUMENT			DNC. FACTOR	Ž.

욷 윋 밁 g Chlorobenzene 1, 4-Dichlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene Tetrachloroethylene 밀 일 밀 일 윋 1, 1-Dichloroethane trans-1, 2-Dichloroethene Chloroform 1, 1, 1-Trichloroethane 1, 2-Dichloroethane

밀

Carbon Tetrachloride

Bromodichloromethane

밁

일

1, 2-Dichloropropane

trans-1, 3-Dichloropropene

1, 1, 2, 2-Tetrachloroethane

뮏

1, 1-Dichloroethene

COMPURATION

RECEIVED: 08/30/84

Analytical Serv Results by Sample

LAB # 84-08-287 Continued From Above

SAMPLE ID RB-20-3, 180

FRACTION 03C TEST CODE GC 601
Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>vg/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

SAMPLE	AMPLE ID RB-20-4, 200	-4, 200		SAMPLE # Date & T	ine le	SAMPLE # 04 FRACTIONS: A, B, C, D Date & Time Collected 08/29/84	A, B, C 18/29/8	0 4	Category	ory	
CA E	17	טר ונ	9.4	CO3 A <1		ш	8	33 HC03 A 88	88	2 2	R
	ug/m]		J/6w	mg/L as Ca	C03		Ug/m1	mg/L as	Cacoa		ug/m1
NA E	9.6	S04 IC	4. 80								
	Ua/m1		Ma / L								

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REPORT Results by Sample Analytical Serv

LAB # 84-08-287

08/30/84

980 RESULT COMPOUNDS DETECTED VERIFIED NAME EPA Method 601/60 Category COMPOUND FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/29/84 ANALYST INSTRUMENT SCAN DATE INJECTED 09/05/84 RESULT COMPOUND 200 SAMPLE 1D RB-20-4, DATA FILE CONC. FACTOR

Trichloroethene 皇 Chloromethane SCAN

皇 Bromomethane

Ž Vinyl Chloride 일 Methylene Chloride

S

Chloroethane

Trichlorofluoromethane

1, 1-Dichloroethene

S

S

1, 1-Dichloroethane

9

trans-1, 2-Dichloroethene

S

S Chloroform

S 1, 2-Dichloroethane

윋 1, 1, 1-Trichloroethane

9 皇 Carbon Tetrachloride Bromodichloromethane

밀 1, 2-Dichloropropane 9

trans-1, 3-Dichloropropene

Dibromoch loromethane

ND

1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene

9

2

2 9 Bromoform 2-Chloroethylvinyl Ether

밁 뫼 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene

2 Chlorobenzene 9 1, 3-Dichlorobenzene S 1, 2-Dichlorobenzene 2 1, 4-Dichlorobenzene

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Analytical Serv REPORT Results by Sample

Samole

LAB # 84-08-287 Continued From Above

SAMPLE 10 RB-20-4, 200

FRACTION 04C TEST CODE GC 601 Date & Time Collected 08/29/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. SCAN = scan number or retention time on chromatogram. All results reported in $\frac{\log L}{\log L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute.

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Analytical Serv REPORT NonReported Work

LAB # 84-08-287

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 DUP 601 01D 02D 03D 04D

EX IN COLUMN IN THE COLUMN IN

PREPARED <u>Radian Analutical Services</u> BV <u>8501 MoPac Blvd.</u> Austin, Texas 78766 (512) 454-4797 P. O. Box 9948 Serv REPORT 08/30/84 16:32:05 ATTEN Analytical Serv SAMPLES or Sacramento McClellan AFB CLIENT MCCLELLAN AF Waune Pearce PAGE 1 RECEIVED: 08/20/84 REPORT Radian Austin COMPANY FACILITY ATTEN

CONTACT CONOVER

LAB # 84-08-186

ODES and NAMES used on this repor				OC
Analytical Serv TEST CODES and NAMES of E calcium, ICPES	CL IC Chloride IC	CO3 A Carbonate	FE E Iron, ICPES	GC 601 EPA Method 601/0
SAMPLE IDENTIFICATION D1 RB-21-1, 130-140	02 RB-21-2, 175-180			

INVOICE under separate cover

212-027-16

WORK ID <u>Reconn Boring</u>

TAKEN 8/17/84

hand

TRANS

TYPE H20

Magnesium, ICPES Sodium, ICPES

HCD3 A MG E NA E S04 IC

Sulfate IC

Bicarbonate

EX KADIMEN

PAGE 2 RECEIVED: 08/20/84

Analytical Serv REPORT Results by Sample

2	SAMPLE ID RB-21-1, 130-140		SAMPLE #		SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/17/84	6. A, B, C, 08/17/84		Category	
14 14	14 CL_IC	14 mg/L	CO3 A <1	C03	A FE	0.84 ug/m1	0.84 HC03 A 83 ug/m1 mg/L as caco3	83 MG E	9.2 ug/m1
22	22 S04 IC	4 Pmg/L							

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RECEIVED: 08/20/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-186

SAMPLE ID RB-21-1, 130-140

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/17/84

NAME EPA Method 601/60 Category

JS6 VERIFIED BY COMPOUNDS DETECTED **KWK** ANALYST INSTRUMENT DATE INJECTED 08/23/84 DATA FILE NC. FACTOR

RESULT Trichloroethene Dibromoch loromethane COMPOUND SCAN 윋 RESULT Chloromethane COMPOUND SCAN

2

1, 1, 2-Trichloroethane

2

cis-1, 3-Dichloropropene 일 뮏 **Bromomethane** Vinyl Chloride

뮏 윋 Ch loroethane Methylene Chloride

윋 Trichlorofluoromethane

月 1, 1-Dichloroethene

1, 1-Dichloroethane trans-1,2-Dichloroethene

얼

2 윋 Chloroform

月 1, 2-Dichloroethane

2 1, 1, 1-Trichloroethane 윋

Carbon Tetrachloride

月 Bromodichloromethane

月 1, 2-Dichloropropane 呈

trans-1, 3-Dichloropropene

욷 윋 뮏 뮏 Bromoform 2-Chloroethylvinyl Ether 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene**

月 Chlorobenzene

윋 뮏 1, 2-Dichlorobenzene 1, 3-Dichlorobenzene

윋 1, 4-Dichlorobenzene

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PAGE 4 RECEIVED: 08/20/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-186 Continued From Above

SAMPLE ID RB-21-1, 130-140

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/17/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropane co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram.

CORPURATION

PAGE 5 RECEIVED: 08/20/84

Analytical Serv REPORT Results by Sample

7 KB-41-6	SAMPLE ID <u>RB-21-2, 175-180</u>		SAMPLE Date &	를 (S) = 1 #	SAMPLE # <u>02</u> FRACTIONS: A, B, C, D Date & Time Collected OB/17/84	5: A, B, C, 08/17/84		Categoru	2	
	OL_10	41	C03_A <1	1	CI FE E	83	28 HC03 A 81 MG E	8		R
							9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			T#/6n
	SU4_IC	2								
cg/ml		mg/L								

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PAGE 6 RECEIVED: 08/20/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-186

NAME EPA Method 601/GC Category TEST CODE GC 601 Date & Time Collected 08/17/84 FRACTION 02C SAMPLE ID RB-21-2, 175-180

980 2 뮏 2 일 2 윋 뮏 뮏 RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether 1, 1, 2, 2-Tetrachloroethane Dibromoch loromethane Tetrachloroethylene 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene COMPOUND 킾 ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 Z S 윋 S S 문 2 月 RESULT Chloromethane Vinyl Chloride Trichlorofluoromethane 1, 1-Dichloroethene Chloroethane Methylene Chloride 1, 1-Dichloroethane Bromomethane COMPOUND DATA FILE CONC. FACTOR SCAN

뮏

Chlorobenzene

윋

trans-1, 2-Dichloroethene

뮏

Chloroform

S

1, 2-Dichloroethane

0, 7

1, 1, 1-Trichloroethane

뮏

Carbon Tetrachloride

2

Bromodichloromethane

2

trans-1, 3-Dichloropropene

밁

1,2-Dichloropropane

S

1, 3-Dichlorobenzene

2

1, 2-Dichlorobenzene

2

1, 4-Dichlorobenzene

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Analytical Serv REPORT Results by Sample

LAB # 84-08-186 Continued From Above

SAMPLE 10 RB-21-2, 175-180

NAME EPA Method 601/GC Category

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/17/84

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. SCAN = scan number or retention time on chromatogram.

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FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

Analytical Serv REPORT NonReported Work

LAB # 84-08-186

DUP 601 DUP 601 01D 02D

RECEIVED: 08/22/84

Analytical Serv

REPORT

LAB # 84-08-219

09/10/84 20:33:55

PREPARED Radian Analytical Services 8501 MoPac Blvd P. O. Box 9948 ВҮ

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<i>'</i>	D.	CFRITEIF
7	K	100

(512) 454-4797 PHONE ATTEN

SAMPLES

COMPANY McClellan AFB

FACILITY

CLIENT MCCLELLAN AF

WORK ID Reconn Boring

TRANS hand carried

TYPE H20

8/22/84

TAKEN

or Sacramento

Austin

REPORT Radian TO B1 4

Wayne Pearce

ATTEN

Austin, Texas 78766

CONTACT CONDVER

please send one copy of the report to Toby Walters in Austin Note: Second column confirmation performed on Split 01C

INVOICE under separate cover

212-027-16

SAMPLE IDENTIFICATION RB-22-2, 140-145 RB-22-3, 175-180 RB-22-1, 95-100 김임임

Analytical Serv TEST CODES and NAMES used on this report EPA Method 601/GC ICPES ICPES Sodium, ICPES Bicarbonate ron, ICPES Chloride IC Magnesium, Carbonate Sulfate IC Calcium, MG E NA E SO4 IC HCD3 A GC 601 C03 A FE

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Analytical Serv REPORT Results by Sample

SAMPLE	ID RB-22-	SAMPLE ID RB-22-1, 95-100		SAMPLE #		SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/22/84	A, B, C, 08/22/8	4	Category	yrc	
CAE	20	20 CL_IC	25 mg/L	CO3 A (1 FE E	C03	<u>.</u>	2.3 ug/m1	2.3 HCO3 A 107 MG E	107 caco3	MG E	17
NA E	24 ug/m1	S04_IC	7.5 mg/L								

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PAGE 3 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-219

SAMPLE ID RB-22-1, 95-100

NAME EPA Method 601/GC FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/22/84

JSG 0.3 밁 Ş 2 S 밁 밁 밁 RESULT S 일 밁 S COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform Chlorobenzene 1, 3-Dichlorobenzene 1, 4-Dichlorobenzene 2-Chloroethylvinyl Ether 1, 2-Dichlorobenzene 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene** Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Category COMPOUND INSTRUMENT ANALYST SCAN DATE INJECTED 08/27/84 밁 N O 2 0.8 2 밁 S 0.3 S 윋 윋 2 물 밁 2 RESULT Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1,2-Dichloroethene Chloroform 1,2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane trans-1, 3-Dichloropropene COMPOUND DATA FILE CONC. FACTOR SCAN

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REPORT Results by Sample Analytical Serv

LAB # 84-08-219 Continued From Above

SAMPLE ID RB-22-1, 95-100

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/22/84

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>uq/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

SAMPLE	10 RB-22-	SAMPLE 1D RB-22-2, 140-145		١.	70 #	FRACTIONS:	A, B, C,	O.			
				Date &	Time	Date & Time Collected 08/22/84	8/25/8	-	Category	-	
CA E	16	16 CL_IC	22	CO3_A <1		<u>u</u> ,	6.1	6. 1 HCO3 A 86 MG E	98	G E	13
	1 /ño		ا الا				1 W / 6 n	mg/L as	cacus		ug/ml
A E	5	21 504 IC	5. 1								
	ug/m]		mg/L								

Commerces as the state of

PAGE 6 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-219

FRACTION O2L TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/22/84 SAMPLE ID RB-22-2, 140-145

			<i>-</i> 75	cted 08/22/84		Lategory	- 1
DATA FILE CONC. FACTOR	∀	DATE INJECTED	D <u>08/27/84</u>	ANALYST	KS A	VERIFIED BY COMPOUNDS DETECTED	TED O
SCAN	MOD	COMPOUND	RESULT	SCAN	00	самРаима	RESULT
		Chloromethane	QN			Trichloroethene	QN
}		Bromomethane	Ω N N		Dibromo	Dibromochloromethane *	ND
		Vinyl Chloride		1	1, 1, 2-Tr	1,1,2-Trichloroethane *	QN
		Chloroethane			cis-1, 3-Di	cis-1,3-Dichloropropene *	ND
	Ωet	Methylene Chloride	QN		2-Chloro	2-Chloroethylvinyl Ether	QN
	Trichlo	Trichlorofluoromethane	QN	1		Bromoform	QN
	1,1	1,1-Dichloroethene	QN	-	, 1, 2, 2-Tetr	1, 1, 2, 2—Tetrachloroethane	QN #
	1,1	1,1-Dichloroethane	QN		Tetrac	Tetrachloroethylene :	QN #
	trans-1,2-Dichlor	2-Dichloroethene	QN			Chlorobenzene	QN
}		Chloraform	Q N		1,3	1,3-Dichlorobenzene	QN
	1,2	1,2-Dichloroethane		İ	1,2	1,2-Dichlorobenzene	QN
	1, 1, 1-	1, 1, 1-Trichloroethane	QN		1, 4	1,4-Dichlorobenzene	QN
	Carbo	Carbon Tetrachloride	QN				
	Втомо	Bromodichloromethane	QN				
	1, 2-	1,2-Dichloropropane	a a				
	trans-1, 3-	trans-1,3-Dichloropropene	GN				

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Analytical Serv REPORT Results by Sample

LAB # 84-08-219 Continued From Above

SAMPLE ID RB-22-2, 140-145

FRACTION O2C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/22/84 Category

NOTES AND DEFINITIONS FOR THIS REPORT.

All results reported in $\frac{104/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 8 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-219

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14 01 10				3	FKAC IUND:	A B	7			
-			Date &		Date & Time Collected 08/22/84	8/25/84		Category	ነጉሂ	
-,)) 10 to	16	CO3 A <1 FE E	₽	'	3.0	3.0 HC03 A 77 MG E	<i>H</i>	A E	11
w/6n		mg/L	mg/L as Ca	E03		ug/ml	mg/L as	CaCO3		ug/ml
NA E 19	S04 IC	2.7								
ug/m1	,	mg/L			:					

C.Justinia Astein

Analytical Serv Results by Sample

REPORT

LAB # 84-08-219

RECEIVED: 08/22/84

SAMPLE ID RB-22-3, 175-180

CONC

JSG g S S 밁 Q Ž 2 2 2 RESULT N N 물 VERIFIED BY COMPOUNDS DETECTED Bromoform Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene FRACTION 03C TEST CODE GC 601 NAME EPA Method 601/GC Date & Time Collected 08/22/84 Category Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane Category COMPOUND Y V ANALYST INSTRUMENT SCAN DATE INJECTED 08/27/84 S 밁 Q 2 밁 2 S 2 2 2 S S S 밁 S RESULT Chloromethane Vinyl Chloride Chloroform Bromome thane 1, 1-Dichloroethene 1, 2-Dichloroethane Carbon Tetrachloride Bromodichloromethane 1, 2-Dichloropropane trans-1, 3-Dichloropropene Chloroethane Methylene Chloride Trichlorofluoromethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane 1, 1-Dichloroethane COMPOUND **V** DATA FILE NC. FACTOR SCAN

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PAGE 10 RECEIVED: 08/22/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-219 Continued From Above

SAMPLE ID RB-22-3, 175-180

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/22/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute All results reported in $\frac{100/L}{100}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT NonReported Work

LAB # 84-08-219

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

CORPORATION

PAGE 1 RECEIVED: 08/27/84

Analytical Serv REPORT 09/10/84 20:28:43

LAB # 84-08-247

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Radian	B1 4	Austin	or Sacramento	Mar	
REPORT	10			ATTEN	

SAMPLES 3

CLIENT MCCLELLAN AF COMPANY MCClellan AFB FACILITY

Radian Analytical Services	. !	P.O. Box 9948	Austin, Texas 78766		(512) 454-4797
PREPARED	BY			ATTEN	PHONE

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C.		CERTIFIED

CONTACT CONDVER

please send one copy of the report to Toby Walters in Austin

Reconn Boring	8/23/84	hand carried	H20	/12-027-16	under separate cover
WORK ID	TAKEN	TRANS	TYPE	# .O .d	INVOICE

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NAMES U	1
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TEST CODES and	
	ICPES
Serv	Calcium,
ical	Ca1
Analytical Serv	CA E Calcium, IC

~			
NTIFICATION	75-85	55-160	175-180
SAMPLE IDEN	RB-23-1, 7	RB-23-2, 1	RB-23-3, 1
	01	020	60

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5									
)					C				
)	S				1/6		PES		
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,	1 Uff	1 i d	one	,,]	Met	rbc	1851	um,	ate
,	Calcium, ICPES	Chloride	Carbonate	Iron, ICPES	EPA Method 601/GC	Bicarbonate	Magnesium, ICPES	Sodium, ICPES	Sulfate IC
	,								2
1	CA E	I	CO3 A	E	GC 601	нсоз А	MG E	NA E	S04 IC
-	C	U	C	4	9	I	Σ	Z	ហ

PAGE 2 RECEIVED: 08/27/84

Analytical Serv REPORT Results by Sample

SAMPLE	1D RB-23-	SAMPLE 1D RB-23-1, 75-85		SAMPLE # 01 FRACTIONS: A, B, C, D	FRACTIO	FRACTIONS: A, B, C, D	, D			
				Date & Time	Collecte	d 08/24/8	4	Category	ry	
CAE	21 C	OF 10	18	C03 A <1	H	8	30 HC03 A 83 MG E	83	MG E	2
	ug/m1		mg/L	mg/L as CaCO3		ug/ml	mg/L as	Cacoa		ug/ml
I NA E	22	S04 IC	10							
	ug/ml		J∕6w							
-	***************************************									

PAGE 3 RECEIVED: 08/27/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-247

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/24/84 SAMPLE ID RB-23-1, 75-85

						S in S in S	
DATA FILE CONC. FACTOR	∢	DATE INJECTED	08/31/84	ANALYST INSTRUMENT	MCL	VERIFIED BY COMPOUNDS DETECTED	BY JSG ED O
SCAN	COM	COMPOUND	RESULT	SCAN	COM	COMPOUND	RESULT
		Chloromethane	QN			Trichloroethene	QN
		Bromomethane	QN	1	Dibromoc	Dibromochloromethane *	Q
		Vinyl Chloride	QN		1, 1, 2-Tri	1,1,2-Trichloroethane *	ΩN
		Chloroethane	QN		cis-1,3-Dic	cis-1,3-Dichloropropene *	QN
	Met	Methylene Chloride	QN		2-Chloroe	2-Chloroethylvinyl Ether	QN
	Trichlorofluor	rofluoromethane	QV	1		Bromoform	QN
	1,1	1,1-Dichloroethene	QN	1	, 1, 2, 2-Tetra	1, 1, 2, 2-Tetrachloroethane #	QN
	1, 1	1,1-Dichloroethane	QN	1	Tetrach	Tetrachloroethylene #	S
	trans-1,2	trans-1,2-Dichloroethene	QN	•		Chlorobenzene	ΩN
		Chloroform	QN		1, 3-	1, 3-Dichlorobenzene	QN
	1,7	1,2-Dichloroethane	QN		1, 2-	1, 2-Dichlorobenzene	QN
	1,1,1	1, 1, 1-Trichloroethane	QN		1,4-	1, 4-Dichlorobenzene	N
	Carbo	Carbon Tetrachloride	QN				
	Втомо	Bromodichloromethane	QN				
	1, 2	1,2-Dichloropropane	QN				
	trans-1,3-Dichlor	Dichloropropene	QN			c	

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RECEIVED: 08/27/84

Results by Sample Analytical Serv

REPORT

LAB # 84-08-247 Continued From Above

SAMPLE ID RB-23-1, 75-85

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/24/84

Category

NAME EPA Method 601/GC

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. uq/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

PAGE 5 RECEIVED: 08/27/84

Analytical Serv REPORT Results by Sample

Category	HCO3 A 88 MG E 13 mg/L as CaCO3	
ONS: A, B, C, E ed 08/23/84	1.3 H	
FRACTI Collect	1	
SAMPLE # 02 FRACTIONS: A, B, C, D Date & Time Collected 08/23/84	CO3 A (1	
	17 mg/L	4 mg/L
SAMPLE ID RB-23-2, 155-160	17 CL_IC	19 SD4_IC
10 RB-23-	17	19
SAMPLE	CA_E	NA E

PAGE 6 RECEIVED: 08/27/84) 1.1.

Analytical Serv REPORT Results by Sample

LAB # 84-08-247

1 NAME EPA Method 601/GC Category	MCL VERIFIED BY JSG B COMPOUNDS DETECTED 0	COMPOUND	Trichloroethene ND	Dibromochloromethane * ND	1,1,2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1,1,2,2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1, 3-Dichlorobenzene ND	1,2-Dichlorobenzene ND	1, 4-Dichlorobenzene ND				
FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/23/84	ANALYST INSTRUMENT	SCAN							1,									
FRACTION 02C Date & Time Col	DATE INJECTED 08/31/84	DUND	Chloromethane ND ;	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND	1,1-Dichloroethene ND	1,1-Dichloroethane ND	trans-1, 2-Dichloroethene ND	Chloroform ND	1, 2-Dichloroethane ND	1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND i	1,2-Dichloropropane ND	trans-1,3-Dichloropropene ND :
3-2, 155-160	В	COMPOUND					Meth	Trichlor	1, 1	1,1	trans-1,2-		1,2-	1, 1, 1-T	Carbon	Bromod	1,2-D	trans-1,3-D
SAMPLE ID RB-23-2, 155-160	DATA FILE CONC. FACTOR	SCAN																

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Analytical Serv REPORT Results by Sample

LAB # 84-08-247 Continued From Above

SAMPLE 1D RB-23-2, 155-160

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/23/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

◆Dibromochloromethane, 1,1,2—trichloroethane and cis-1,3—dichloropropene co-elute. NO=not detected at EPA detection limit method 601, (Federai Register, 12/3/79). #1,1,2,2—tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in___

PAGE 8 RECEIVED: 08/27/84

Analytical Serv REPORI Results by Sample

מאווירני	10 KB-23-	SAMPLE 10 KB-23-3, 1/5-180		Date & Time	# 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1	4 FRACILUNS: A, B, C, D Collected 08/23/84	S. A. B. C. 08/23/8	4	Category	
CA E	19	2I TO	17 mg/L	CO3 A <1	Cac03	H.	4.0	HCO3 A mg/L as	4.0 HCO3 A 96 MG E	16 1m/gu
ME	20	504_10	5 7/Ew							

RECEIVED: 08/27/84

Results by Sample Analytical Serv

LAB # 84-08-247

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/23/84 SAMPLE 1D RB-23-3, 175-180

989 VERIFIED BY CDMPOUNDS DETECTED NAME EPA Method 601/60 Category χ ANALYST INSTRUMENT DATE INJECTED 08/31/84 V) DATA FILE CONC. FACTOR

RESULT

COMPOUND

Trichloroethene

S

S

2

1, 1, 2-Trichloroethane

Dibromochloromethane

N cis-1, 3-Dichlaropropene

밁 S Bromoform 2-Chloroethylvinyl Ether

S 1, 1, 2, 2-Tetrachloroethane

일 Tetrachloroethylene

뮏 Chlorobenzene

S 1, 3-Dichlorobenzene

2 1, 2-Dichlorobenzene

呈 1, 4-Dichlorobenzene

뮏

밁

g Bromodichloromethane

밁 1, 2-Dichloropropane

밁 trans-1,3-Dichloropropene

REPORT

RESULT

Chloromethane

SCAN

COMPOUND

SCAN

윋

Bromomethane

Q

Vinyl Chloride

2

Chloroethane

Q

Methylene Chloride

밁

S

Trichlorofluoromethane

1,1-Dichloroethene

욷

1, 1-Dichloroethane

2

trans-1, 2-Dichloroethene

Chloroform

S

뮏

밁

1, 2-Dichloroethane

1, 1, 1-Trichloroethane

Carbon Tetrachloride

1.

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Analytical Serv REPORT Results by Sample

LAB # 84-08-247 Continued From Above

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SAMPLE ID RB-23-3, 175-180

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/23/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in <u>ug/L</u> unless otherwise specified. NO = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

LAB # 84-08-247

Analytical Serv REPORT NonReported Work PAGE 11 RECEIVED: 08/27/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE DUP 601 DUP 601 DUP 601 01D 02D 03D

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K ALEMAN

Analytical Serv

LAB # 84-08-031

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CONTACT CONDVER PREPARED <u>Radian Analytical Services</u> BY <u>8501 MoPac Blvd.</u> Austin, Texas 78766 (512) 454-4797 Box 9948 Serv REPORT 08/22/84 14:23:38 <u>-</u> ATTEN SAMPLES or Sacramento CLIENT MCCLELLAN AF COMPANY MCCIEILAN AFB FACILITY Wayne Pearce PAGE 1 RECEIVED: 08/03/84 REPORT Radian TO B1 4 Austin ATTEN

SAMPLE IDENTIFICATION	Analytical Serv TEST CODES and NAMES used on this report
RB-24-1 85-90 (CWD)	CA E Calcium, ICPES
, 105-110	CL IC Chloride IC
120-130	CO3 A Carbonate
	FE E Iron, ICPES
	GC 601 EPA Method 601/GC
	HCO3 A Bicarbonate
	MG E Magnesium, ICPES
	NA E Sodium, ICPES

INVOICE under separate cover

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P 0 # 212-027-16

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TYPE !

TAKEN 8/2/84, T. Walters

hand carried

WORK ID Reconn. Boring

SO4 IC Sulfate IC

PAGE 2 RECEIVED: 08/03/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-031

B, C, D 2/84 Category	7.9 HC03 A 100 MG E 13 ug/ml	
SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/02/84		
SAMPLE # Date & T	21 CO3 A <1 mg/L as CaCO3	7.1 mg/L
[-1	31 73	S04_IC
SAMPLE ID RB-24-	CA_E19	NA E

TA AMICOMATION CONFORMATION

RECEIVED: 08/03/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-031

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/02/84 SAMPLE ID RB-24-1

986 RESULT 밁 밁 VERIFIED BY COMPOUNDS DETECTED Trichloroethene Dibromachloromethane COMPOUND MCL ANALYST INSTRUMENT SCAN DATE INJECTED 08/10/84 S 밁 **RESULT** Chloromethane Bromomethane COMPOUND DATA FILE SCAN

cis-1, 3-Dichloropropene Q Vinyl Chloride

S S Chloroethane Methylene Chloride

Trichlorofluoromethane

윋

S

1, 1-Dichloroethene 1,1-Dichloroethane

일

S trans-1, 2-Dichloroethene 밁

Chloroform

욷 1,2-Dichloroethane

2 1, 1, 1-Trıchloroethane

2 Bromodichloromethane

밁

Carbon Tetrachloride

밁 1,2-Dichloropropane

물

trans-1,3-Dichloropropene

1, 1, 2-Trichloroethane

ΩN

N

2 2-Chloroethylvinyl Ether

뮏 N Bromoform 1, 1, 2, 2-Tetrachloroethane QN Chlorobenzene

밁

Tetrachloroethylene

Ω 1, 3-Dichlorobenzene

밁 1,2-Dichlorobenzene

Z 1, 4-Dichlorobenzene

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PAGE 4 RECEIVED: 08/03/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-031 Continued From Above

SAMPLE ID RB-24-1

FRACTION O1C TEST CODE GC 601 Date & Time Collected 08/02/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2 \sim trıchloroethane and cis=1,3=dichloropropene co=elute. All results reported in $\frac{\log L}{L}$ unless otherwise specified. NO \approx not detected at EPA detection limit method 601, (Federal Register, #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram

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PAGE 5 RECEIVED: 08/03/84

Analytical Serv REPURI Results by Sample

SAMPLE	ID RB-24-	SAMPLE ID RB-24-2, 105-110		SAMPLE Date	# H	SAMPLE # 02 FRACTIONS: A,B,C,D Date & Time Collected 08/02/84	5: A, B, C 08/02/8	, D	Category	
CAE	19	כר ונ	21 mg/L	CO3 A (1	(1 cac03	H.	8. 4 09/m1	8.4 HC03 A 98	98 MG E	16 [m/gu
NA E	77 26 09/ml	S04_IC	7 mg/L							

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RECEIVED: 08/03/84

Analytical Serv

Serv REPORT Results by Sample

LAB # 84-08-031

756 g QN 일 S 밁 밁 밁 밁 2 RESULT 밁 S g VERIFIED BY COMPOUNDS DETECTED Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1,3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene NAME EPA Method 601/GC Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Category COMPOUND MCL TEST CODE GC 601 FRACTION OZC TEST CODE GC 60 Date & Time Collected 08/02/84 ANALYST INSTRUMENT SCAN DATE INJECTED 08/10/84 밁 밁 밁 밁 2 S S 2 Ω 2 윋 Z 밁 S 뮈 RESULT ö Chloromethane Bromomethane Vinyl Chloride Methylene Chloride Trichlorofluoromethane 1,1-Dichloroethane Chloroform 1,2-Dichloroethane 1,2-Dichloropropane trans-1, 3-Dichloropropene Chloroethane 1, 1-Dichloroethene trans-1,2-Dichloroethene 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane COMPOUND SAMPLE ID RB-24-2, 105-110 凹 DATA FILE CONC. FACTOR SCAN

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PAGE 7 RECEIVED: 08/03/84

Analytical Serv REPORI Results by Sample

LAB # 84-08-031 Continued From Above

SAMPLE ID RB-24-2, 105-110

FRACTION O2C TEST CODE GC 601 Date & Time Collected 08/02/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2—trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79) #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. uq/L unless otherwise specified SCAN = scan number or retention time on chromatogram All results reported in__

LT CORPORATION

PAGE 8 RECEIVED: 08/03/84

Analytical Serv Results by Sample

LAB # 84-08-031

	RB-24-	SAMPLE ID RB-24-3, 120-130		SAMPLE	- 103 + 103	SAMPLE # 03 FRACTIONS: A, B, C, D	5. A. B. C.	Ω'			
				חפונה	<u></u>	נסוופרנהם	00/05/0	3-	rategori	-	
CA E	19 CL IC	01 70	20	CO3 A	\Box	<u>س</u> ا	0.18	13 A <1 FE E 0.18 HC03 A <1 MG E			15
	ug/m1		mg/L	mg/L as (caco3		ug/m1	mg/L as	CaC03		ug/m1
NA E	22	S04 IC	∞								
			mg/L								

TO AN EXPLANATION

RECEIVED: 08/03/84

Analytical Serv

REPORT Results by Sample

LAB # 84-08-031

SAMPLE ID <u>RB-24-3, 120-130</u>

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/02/84

NAME EPA Method 601/GC

98 S Q N 밁 윋 g 밁 밁 RESULT 뮏 2 밁 밁 밁 VERIFIED BY COMPOUNDS DETECTED Bromoform Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Tetrachloroethylene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Category COMPOUND MCL ⋖ ANALYST INSTRUMENT SCAN DATE INJECTED 08/10/84 S 2 Q g 밁 밁 2 g 윋 g 윋 2 밁 2 RESULT **Chloromethane** Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1,1-Dichloroethane Chloroform 1,2-Dichloroethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane Bromodich lorome thane Carbon Tetrachloride COMPOUND DATA FILE CONC. FACTOR SCAN

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trans-1,3-Dichloropropene

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1, 2-Dichloropropane

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Analytical Serv REPORT Results by Sample

LAB # 84-08-031 Continued From Above

SAMPLE ID RB-24-3, 120-130

FRACTION 03C TEST CODE GC 601 Date & Time Collected 08/02/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. unless otherwise specified. SCAN = scan number or retention time on chromatogram. 1/bn All results reported in_

PAGE 1 RECEIVED: 09/04/84

Analytical Serv REPORT 09/26/84 11:26:07

LAB # 84-09-012

Analytical Ser

specific matrix was not within acceptable limits indicating please send one copy of the report to Toby Walters in Austin CONTACT CONDVER * Indicates a value less than 5 times the detection limit @ Indicates that spike recovery for this analysis on the ERTIFIED BY which must be interpreted accordingly PREPARED <u>Radian Analutical Services</u> BY 8501 MoPac Blvd. Austin, Texas 78766 (512) 454-4797 Box 9948 <u>م</u> PHONE ATTEN n SAMPLES under separate cover MCCLELLAN AF McClellan AFB or Sacramento Reconn Boring Wayne Pearce hand carried 212-027-16 REPORT Radian Austin 9/1/84 4 10 TYPE WORK ID TAKEN ATTEN CL IENT COMPANY TRANS P. O. # INVOICE FACILITY

SAMPLE IDENTIFICATION

O1 RB-25-1, 140

O2 RB-25-2, 160

O3 RB-25-3, 190

Analytical Serv TEST CODES and NAMES used on this report

CA E Galcium, ICPES
CL IC Chloride IC
CO3 A Carbonate
FE E Iron, ICPES
GC 601 EPA Method 601/GC
HGO3 A Bicarbonate
MA E Sodium, ICPES
NA E Sodium, ICPES
SO4 IC SUlfate IC

an interferent present

	LAB # 84-09-012					-						
	REPORT Test	88-25-3		(entered Units)	함	14	V	4.1	06	81	50	76
	tical Serv RESULTS BY TEST	18-25-2	Sample 02	(entered Units)	110	15	V	8	78	61	55	320
100	Analytic	88-25-1		(entered Units)	23	£	♥	쯨	88	55	23	53
CORPORATION	PAGE 2 RECEIVED: 09/04/84		TEST CODE	משלים מיויים	CA_E						NA E	204 IC

PAGE 3 RECEIVED: 09/04/84

Analytical Serv RePORT Results by Sample

LAB # 84-09-012

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1.1

NAME EPA Method 601/GC

Category

SAMPLE ID RB-25-1, 140

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/01/84

500 밀 일 2 밁 2 문 윋 9 RESULT g 일 9 2 COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane **Tetrachloroethylene** COMPOUND Y V ANALYST INSTRUMENT SCAN DATE INJECTED 09/07/84 밀 皇 밁 뮏 ᄝ 욷 밁 9 2 윋 밁 밁 뮏 ᄝ RESULT Chloromethane 1, 1-Dichloroethene Chloroform Vinyl Chloride Chloroethane Trichlorofluoromethane Bromomethane Methylene Chloride 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

윋

trans-1, 3-Dichloropropene

밁

1, 2-Dichloropropane

RECEIVED: 09/04/84

SAMPLE ID RB-25-1, 140

Serv REPORT Results by Sample Analytical Serv

LAB # 84-09-012 Continued From Above

1

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/01/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2—trichloroethane and cis—1,3—dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

PAGE 5 RECEIVED: 09/04/84

REPORT Results by Sample Analytical Serv

LAB # 84-09-012

1

SAMPLE ID RB-25-2, 160

FRACTION O2C TEST CODE GC 601 Date & Time Collected 09/01/84

NAME EPA Method 601/GC

Category

잉 2 9 S 2 皇 S 밀 RESULT Z 밀 뫼 2 밁 COMPOUNDS DETECTED VERIFIED BY Bromoform Trichloroethene Chlorobenzene 2-Chloroethylvinyl Ether 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane cis-1, 3-Dichloropropene Tetrachloroethylene COMPOUND χ Ω Φ ANALYST INSTRUMENT SCAN DATE INJECTED 09/07/84 밁 밁 밁 밀 9 2 윋 밁 밁 윋 뮏 9 밀 밀 밁 9 RESUL T Chloromethane Bromomethane Vinyl Chloride Methylene Chloride 1, 1-Dichloroethene 1, 1-Dichloroethane Chloroform 1, 2-Dichloroethane 1,2-Dichloropropane trans-1, 3-Dichloropropene Chloroethane Trichlorofluoromethane trans-1, 2-Dichloroethene 1, 1, 1-Trichloroethane Carbon Tetrachloride Bromodichloromethane COMPOUND DATA FILE CONC. FACTOR SCAN

RECEIVED: 09/04/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-012 Continued From Above

SAMPLE ID RB-25-2, 160

FRACTION O2C TEST CODE GC 601
Date & Time Collected 09/01/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute All results reported in <u>ug/L</u> unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Serv REPORT Results by Sample Analytical Serv

LAB # 84-09-012

SAMPLE ID RB-25-3, 190

FRACTION 03C TEST CODE GC 601 NAME EPA Method 601/GC Date % Time Collected 09/01/84 Category

980 COMPOUNDS DETECTED VERIFIED BY Category ANALYST INSTRUMENT DATE INJECTED 09/07/84 DATA FILE CONC. FACTOR

RESULT	ne ND	QN *	QN *
COMPOUND	Trichloroethene	Dibromochloromethane	1,1,2-Trichloroethane
SCAN			
RESULT	QN	Q	QN
COMPOUND	Chloromethane	Bromomethane	Vinyl Chloride
SCAN	-		

1	1,1,2-Trichloroethane * .	cis-1,3-Dichloropropene * _	2-Chloroethylvinyl Ether
-	Vinyl Chloride ND	Chloroethane ND	thylene Chloride ND :
		-	Ψ

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9

2

Bromoform

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2

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Trichlorofluoromethane ND i Bromofo	1, 1-Dichloroethene ND : 1, 1, 2, 2-Tetrachloroethane

Tetrachloroethylene #	Chlorobenzene	1,3-Dichlorobenzene

1,1-Dichloroethane ND ;	trans-1,2-Dichloroethene ND	Chloroform ND

Chloroform ND; 1, 3-Dichlorobenzene	1,2-Dichloroethane ND ; 1,2-Dichlorobenzene	i, 1, 1-Trichloroethane ND 1, 4-Dichlorobenzene
•	•	Trichloroethane
		ļ

1, 1, 1-Trichloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1, 2-Dichloropropane ND

밁

trans-1, 3-Dichloropropene

PAGE 8 RECEIVED: 09/04/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-012 Continued From Above

SAMPLE ID RB-25-3, 190

3, 190

FRACTION 03C TEST CODE GC 601 NAM Date & Time Collected 09/01/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{uq/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT NonReported Work

LAB # 84-09-012

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

CURPURATION

RECEIVED: 08/31/84 PAGE 1

Serv REPORT 09/24/84 11:30:20 Analytical Serv

LAB # 84-08-299

SAMPLES MCCLELLAN AF or Sacramento Wayne Pearce Austin REPORT Radian CLIENT ATTEN

COMPANY

FACILITY

PREPARED <u>Radian Analytical Services</u>
BY <u>8501 MoPac Blvd.</u> Austin, Texas 78766 (512) 454-4797 Box 9948 0 PHONE ATTEN

CERTIFIED BY

CONTACT CONDVER

please send one copy of the report to Toby Walters in Austin

under separate cover WORK ID Reconn Boring hand carried P. O. # 212-027-16 TAKEN 8/30/84 INVOICE TYPE TRANS

Analytical Serv TEST CODES and NAMES used on this report

Chloride IC

SAMPLE IDENTIFICATION

RB-26-1, 120 RB-26-2, 140

김영잉

RB-26-3, 200

EPA Method 601/GC Iron, ICPES Bicarbonate Carbonate HCO3 A C03 A GC 601 E E

Magnesium, ICPES Sodium, ICPES NA E SO4 IC MG E

Sulfate IC

PAGE 2 RECEIVED: 08/31/84

Analytical Serv Results by Sample

LAB # 84-08-299

VANTE	SAMPLE 10 KB-26-1, 120	-1, 120		SAMPLE Date &	# in the state of	SAMPLE # 01 FRACTIONS: A, B, C, D Date & Time Collected 08/30/84	5: A, B, C, 08/30/84		Category	P.C	
CA E	C3 (3)	12 00 10	13	C03_A <1		u u	4	HC03_A 67 MG_E	19	MG E	9.7
MA T		SDA 16	ارو# م ا				7 H / So	7 7 7			7 m C fr
1 1	ug/m1		J. 7								

COMPONANTON

RECEIVED: 08/31/84

REPORT Results by Sample Analytical Serv

LAB # 84-08-299

NAME EPA Method 601/GC

Category

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/30/84 SAMPLE ID RB-26-1, 120

ဗ္ဗ 밀 2 2 ÿ 2 밀 2 밀 밁 일 2 9 RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane 1, 1, 2-Trichloroethane COMPOUND ANALYST INSTRUMENT SCAN DATE INJECTED 09/05/84 밁 일 S 2 呈 g 밀 밁 밁 밀 밀 0 밁 밁 RESULT **Chloromethane** Vinyl Chloride Chloroethane Chloroform 1, 1, 1-Trichloroethane **Bromomethane** Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene 1, 2-Dichloroethane Carbon Tetrachloride **Bromodichloromethane** COMPOUND DATA FILE CONC. FACTOR SCAN

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1,2-Dichloropropane

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trans-1, 3-Dichloropropene

PAGE 4 RECEIVED: 08/31/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-299 Continued From Above

SAMPLE 10 RB-26-1, 120

FRACTION OIC TEST CODE GC 601 Date & Time Collected 08/30/84

Category

NAME EPA Method 601/60

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{100/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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Analytical Serv REPORT Results by Sample

LAB # 84-08-299

SAMPLE	MAMPLE ID RB-26-2, 140	2, 140		Date & Time Collected 08/30/84	E Coll	ACLIUNS: ected 0	A, B, C, 84		Category	=	
CA E	5,6	כר ונ	13 mg/L	CO3 A (1 FE E		LLI	1, 9 ug/m1	303 A mg/L as	. 67 M	<u> </u>	4, 1
NA E	8. S	S04_IC	3.9								

PAGE 6 RECEIVED: 08/31/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-299

SAMPLE ID RB-26-2, 140

FRACTION 02C

TEST CODE GC 601 NAME EPA Method 601/GC

SAMPLE ID NB-EO-E: 140		Date & Time Col	Date & Time Collected 08/30/84	Category
DATA FILE	B DATE INJE	INJECTED 09/05/84	ANALYSTINSTRUMENT	KS VERIFIED BY JSG B COMPOUNDS DETECTED 1
SCAN	COMPOUND	RESULT	SCAN	COMPOUND RESULT
	Chloromethane	ane ND		Trichloroethene ND
	Bromomethane	dN aner		Dibromochloromethane * ND
	Vinyl Chloride	ride ND		1, 1, 2-Trichloroethane * ND
	Chloroethane	ON aner		cis-1,3-Dichloropropene * ND
	Methylene Chloride	ride NE		2-Chloroethylvinyl Ether ND
1	Trichlorofluoromethane	1 2 2 1		Bromoform ND
	1, 1-Dichloroethene	nene ND	1,1	1, 1, 2, 2-Tetrachloroethane # ND
	1, 1-Dichloroethane	ane ND		Tetrachloroethylene # ND
	trans-1,2-Dichloroethene	ON ener		Chlorobenzene ND
	Chloroform	Form ND		1, 3-Dichlorobenzene ND
	1,2-Dichloroethane	ane ND		1, 2-Dichlorobenzene ND
	1, 1, 1-Trichloroethane	ane ND		1, 4-Dichlorobenzene ND
	Carbon Tetrachloride	ride ND		
İ	Bromodichloromethane	nane ND		
	1,2-Dichloropropane	ane ND		
	trans-1, 3-Dichloropropene	Osne ND		

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Analytical Serv RePORT Results by Sample

LAB # 84-08-299 Continued From Above

SAMPLE ID RB-26-2, 140

FRACTION 02C TEST CODE GC 601 Date & Time Collected 08/30/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{uq/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

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LAB # 84-08-299

Analytical Serv REPORT Results by Sample

CA E B.7 cL IC 14 cO3 A (1 FE E 0.35 HCO3 A 86 MG E INA E 10 SO4 IC 6.3	SAMPLE	ID RB-26-3, 200	3, 200		SAMPLE # 00	3 FRACTION	VS: A, B, C	Q'		
E 8.7 CL IC 14 CO3 A (1 FE E 0.35 ug/ml mg/L as CaCO3 E ug/ml mg/L as CaCO3 L ug/ml mg/L as CaCO3 E ug/ml					Date & Time	Collecter	1 08/30/8	4	Category	
E 10 SO4 IC 6.3 mg/L as CaCO3 ug/ml mg/L ug/ml mg/L	CAE	8.7)I T)	14	C03 A <1		0.35	HCO3 A	86 MG E	4 Ó
E 10 S04 IC		ug/ml		J/6w	mg/L as CaCO	 	ug/m1	mg/L as	Caco	ug/m1
	NA E	10	S04 IC	6.3						
		ug/ml	1	mg/L						

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RECEIVED: 08/31/84

Analytical Serv REPORT Results by Sample

LAB # 84-08-299

SAMPLE ID RB-26-3, 200

FRACTION O3C TEST CODE GC 601
Date & Time Collected 08/30/84

NAME EPA Method 601/GC Category

VERIFIED BY COMPOUNDS DETECTED ANALYST INSTRUMENT DATE INJECTED 09/05/84 DATA FILE CONC. FACTOR

55 CA

RESULT

COMPOUND SCAN 밁 RESULT Chloromethane COMPOUND SCAN

ᄝ Bromomethane

S Vinyl Chloride

Chloroethane

2

Methylene Chloride

2

Trichlorofluoromethane

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1, 1-Dichloroethene

QN.

9

1, 1-Dichloroethane trans-1, 2-Dichloroethene Chloroform

2

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1, 2-Dichloroethane

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1, 1, 1-Trichloroethane

0

밁 Carbon Tetrachloride

2 Bromodichloromethane

9 1, 2-Dichloropropane ᄝ

trans-1, 3-Dichloropropene

Trichloroethene

1, 1, 2-Trichloroethane

2

2

Dibromoch loromethane

9 밀 2-Chloroethylvinyl Ether cis-1, 3-Dichloropropene

S Bromoform

S Tetrachloroethylene

1, 1, 2, 2-Tetrachloroethane

2 1, 3-Dichlorobenzene

o

Chlorobenzene

밀 1, 2-Dichlorobenzene 2 1, 4-Dichlorobenzene

PAGE 10 RECEIVED: 08/31/84

Analytical Serv Results by Sample

REPORT mole

LAB # 84-08-299 Continued From Above

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[..

SAMPLE 1D RB-26-3, 200

FRACTION 03C TEST CODE 6C 601 Date & Time Collected 08/30/84

NAME EPA Method 601/GC Category

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NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. SCAN = scan number or retention time on chromatogram. All results reported in $\frac{19/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute.

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Analytical Serv REPORT NonReported Work

LAB # 84-08-299

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

RECEIVED: 09/07/84

PAGE 1

LAB # 84-09-050

Serv REPORT 09/26/84 11:22:17

Analytical Serv

specific matrix was not within acceptable limits indicating please send one copy of the report to Toby Walters in Austin CONTACT CONDVER * Indicates a value less than 5 times the detection limit @ Indicates that spike recovery for this analysis on the CERTIFIED BY 2nd column confirmation performed on split G2C which must be interpreted accordingly. Services Austin, Texas 78766 PREPARED Radian Analytical B501 MoPac Blvd an interferent present (512) 454-4797 P. O. Box 9948 ВУ PHONE ATTEN SAMPLES under separate cover SAMPLE IDENTIFICATION or Sacramento McClellan AFB Reconn Boring Wayne Pearce MCCLELLAN AF hand carried 212-027-16 REPORT Radian Austin 9/6/84 COMPANY FACILITY 10 TAKEN TYPE P. O. # ATTEN WORK ID TRANS CL IENT INVOICE

Analytical Serv TEST CODES and NAMES used on this report

CA E Calcium, ICPES
CL IC Chloride IC
CO3 A Carbonate
FE E Iron, ICPES
GC 601 EPA Method 601/GC
HCO3 A Bicarbonate
MG E Magnesium, ICPES
NA E Sodium, ICPES
SO4 IC Sulfate IC

RB-27-1, 150-160 RB-27-2, 180-190

임임

AGE 2	Analuti	tical Serv	REPORT	LAB # 84-09-050
RECEIVED: 09/07/84			TEST	
	88-27-1	28-27-2		
TEST CODE	(entered units)	Sample 02		
CAE		1		
	\$\psi\$	14		
	5	7		
	rú	1.6		
	112	66		
	15	13		
NA E	17	16		
S04 IC	_	സ		

	09/0//84
FAGE 3	RECEIVED.

Results by Sample Analytical Serv

LAB # 84-09-050

SAMPLE ID RB-27-1, 150-160

VERIFIED BY Category RAA HRACIION OIC TEST CODE GC 601 Date & Time Collected 09/06/84 DATE INJECTED 09/11/84 D

JSC RESULT COMPOUNDS DETECTED COMPOUND INSTRUMENT SCAN RESULT COMPOUND DATA FILE CONC

2 Trichloroethene SCAN

Dibromochloromethane 윋 욷 Chloromethane Bromomethane

S 2 Vinyl Chloride

Chloroethane Methylene Chloride

Trichlorofluoromethane

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1, 1-Dichloroethene

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皇 1, 1-Dichloroethane

trans-1, 2-Dichloroethene

2

밁 Chloroform

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9 1, 1, 1-Trichloroethane 2 Carbon Tetrachloride

1,2-Dichloropropane

1, 4-Dichlorobenzene

2 Bromodichloromethane

S

REPORT

NAME EPA Method 601/GC

S

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1, 1, 2-Trichloroethane

cis-1, 3-Dichloropropene

2

g

Bromoform

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1, 1, 2, 2-Tetrachloroethane

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2-Chloroethylvinyl Ether

2

Tetrachloroethylene

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Chlorobenzene

2

1, 3-Dichlorobenzene

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1, 2-Dichlorobenzene

2

1, 2-Dichloroethane

trans-1, 3-Dichloropropene

일

PAGE 4 RECEIVED: 09/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-050 Continued From Above

SAMPLE ID RB-27-1, 150-160

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/06/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram All results reported in_

RECEIVED: 09/07/84

REPORT Analytical Serv

Results by Sample

NAME EPA Method 601/GC

LAB # 84-09-050

386 밁 2 S N 皇 S 2 밀 S 皇 밁 밁 RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene Bromoform 2-Chloroethylvinyl Ether Chlorobenzene 1, 3-Dichlorobenzene 1, 2-Dichlorobenzene 1, 4-Dichlorobenzene cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Dibromochloromethane 1, 1, 2-Trichloroethane Tetrachloroethylene Category COMPOUND TEST CODE GC 601 FRACTION O2C TEST CODE GC 60 Date & Time Collected 09/06/84 ANAL YST INSTRUMENT SCAN DATE INJECTED 09/11/84 9. S 0.6 뮏 S g 2 뮏 S 2 밀 밁 2 RESULT Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Trichlorofluoromethane 1, 1-Dichloroethene 1, 1-Dichloroethane trans-1, 2-Dichloroethene Chloroform 1, 2-Dichloroethane 1, 1, 1-Trichloroethane Carbon Tetrachloride COMPOUND SAMPLE ID RB-27-2, 180-190 DATA FILE CONC. FACTOR SCAN

0

Bromodichloromethane

S

1, 2-Dichloropropane

밁

trans-1, 3-Dichloropropene

PAGE 6 RECEIVED: 09/07/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-050 Continued From Above

SAMPLE ID RB-27-2, 180-190

FRACTION O2C TEST CODE GC 601
Date & Time Collected 09/06/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in_

PAGE 7 RECEIVED: 09/07/84

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

Analytical Serv REPORT NonReported Work

LAB # 84-09-050

01D 02D

DUP 601 DUP 601

PAGE 1 RECEIVED: 09/05/84

Analytical Serv REPORT 09/26/84 09:31:43

LAB # 84-09-023

MENTIFIED BY	CONTACT CONDUER		oby Walters in Austin		he detection limit		s analysis on the	able limits indicating
PREPARED <u>Radian Analytical Services</u> BY 8501 MoPac Blvd. P. D. Box 9948 Austin, Texas 78766	ATTEN PHONE (512) 454-4797		please send one copy of the report to Toby Walters in Austin		* Indicates a value less than 5 times the detection limit	which must be interpreted accordingly.	@ Indicates that spike recovery for this analysis on the	specific matrix was not within acceptable limits indicating
PREPARED BY	ATTEN		please		* Indice	which	@ Indica	Specit
	O D NAME OF THE PARTY OF THE PA	3411 3						over
REPORT Radian TO B1. 4 Austin or Sacramento	ATTEN Wayne Pearce	OMPANY MCClellan AFB CILITY		WORK ID Reconn Boring	EN 9/4/84	RANS hand carried	# 212-027-16	INVOICE under separate cover
REPO!	ATT	COMPANY FACILITY		MORK	TAKEN	TRANS	. O. d.	INVOI

AMES used on this report						,			
Analytical Serv TEST CODES and NAMES used on this report	Calcium, ICPES	Chloride IC	Carbonate	Iron, ICPES	EPA Method 601/GC	Bicarbonate	Magnesium, ICPES	Sodium, ICPES	Sulfate IC
Analyti	CAE	CL IC	C03 A	ננו ננו	GC 601	HCO3 A	MG E	NA E	S04 IC

an interferent present

SAMPLE IDENTIFICATION

** 1

RECEIVED: 09/05/84	Analy	Analyticai Serv RESULTS BY TFST	REPORT TFST	LAB # 84-09-023
	RB-28-1	PB-28-2	813.28.4	
TEST CODE	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03	
CA E	22	15	19	
) JO	18	13	E.	
CD3 A CACOR	₽	ワ	₽	
	1.2	സ്	5.7	
HCO3_A	116	109	112	
	4	10	4	
	82	16	18	
S04 IC	8	സ്	m d	

RECEIVED: 09/05/84

REPORT Results by Sample Analytical Serv

LAB # 84-09-023

NAME EPA Method 601/GC Category FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/04/84 SAMPLE 10 RB-28-1, 120

COMPOUNDS DETECTED VERIFIED BY RAA ANALYST INSTRUMENT DATE INJECTED 09/10/84 DATA FILE CONC. FACTOR

38

oromethane omomethane		Trichloroethene	Dibromochloromethane * ND
	מביות מסוקה		

cis-1,3-Dichlorop	Chloroethane ND	
1, 1, 2-Trichloro	Vinyl Chloride ND	
Dibromochlorom	Bromomethane ND	

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oethane

2

propene

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2-Chloroethylvinyl Ether

밁

Bromoform

 Q	QN
Methylene Chloride	Trichlorofluoromethane

S	Q
1,1-Dichloroethene	1,1-Dichloroethane

밁

Tetrachloroethylene

2

Chlorobenzene

모

1, 3-Dichlorobenzene

2

1, 2-Dichlorobenzene

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1, 4-Dichlorobenzene

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1, 1, 2, 2-Tetrachloroethane

·	
QN	C Z
trans-1, 2-Dichloroethene	Chloroform

•	•	
 	 •	-
S	Z	
1,2-Dichloroethane	1, 1, 1-Trichloroethane	

a ON	2
Bromodichloromethane	1.2-Dichloropropane

밁

trans-1, 3-Dichloropropene

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Analytical Serv REPORT Results by Sample

LAB # 84-09-023 Continued From Above

SAMPLE 10 RB-28-1, 120

FRACTION OIC TEST CODE GC 601
Date & Time Collected 09/04/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{uq/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

RECEIVED: 09/05/84

REPORT Analytical Serv

LAB # 84-09-023

Results by Sample SAMPLE ID RB-28-2, 160

NAME EPA Method 601/60 FRACTION O2C TEST CODE GC 601 Date & Time Collected 09/04/84

286 RESULT COMPOUNDS DETECTED VERIFIED BY Category RAA ANALYST INSTRUMENT SCAN DATE INJECTED 09/10/84 RESULT COMPOUND DATA FILE CONC. FACTOR SCAN

COMPOUND

Trichloroethene Dibromochloromethane

ᄝ

Chloromethane

밁

Bromomethane

밁

1, 1, 2-Trichloroethane

밁

웆

2

cis-1, 3-Dichloropropene

2 2-Chloroethylvinyl Ether 윋

Bromoform

9 1, 1, 2, 2-Tetrachloroethane 9 **Tetrachloroethylene** 2 Chlorobenzene

밁 1, 3-Dichlorobenzene 밀 1, 2-Dichlorobenzene

1, 4-Dichlorobenzene

2

皇

1,2-Dichloropropane

trans-1, 3-Dichloropropene

Carbon Tetrachloride

Bromodichloromethane

일

일

S

Vinyl Chloride

Chloroethane

뮏

Methylene Chloride

밁

Trich lorofluoromethane

呈

2

1, 1-Dichloroethene

1, 1-Dichloroethane

윋

9

trans-1, 2-Dichloroethene

Chloroform

ᄝ

1, 2-Dichloroethane

밁

1, 1, 1-Trichloroethane

2

밁

RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-023 Continued From Above

SAMPLE ID RB-28-2, 160

FRACTION O2C TEST CODE GC 601 Date & Time Collected 09/04/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

All results reported in uq/L unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). *Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. unless otherwise specified. SCAN = scan number or retention time on chromatogram.

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Analutical Serv

REPORT

LAB # 84-09-023

	N.
Sample	FRACTION 03C TEST CODE GC 601
Results by Sample	FRACTION 03C
	180
ED: 09/05/84	ID RB-28-3, 180

080 밁 S 2 2 2 9 2 2 2 2 RESULT COMPOUNDS DETECTED VERIFIED BY Trichloroethene 2-Chloroethylvinyl Ether Chlorobenzene Bromoform 1, 3-Dichlorobenzene ME EPA Method 601/GC Dibromochloromethane cis-1, 3-Dichloropropene 1, 1, 2, 2-Tetrachloroethane Tetrachloroethylene 1, 1, 2-Trichloroethane Category COMPOUND RAA uate & lime Collected U7/U4/84 ANALYST INSTRUMENT SCAN DATE INJECTED 09/10/84 2 윋 밁 2 皇 2 Q 2 2 밁 RESULT Chloromethane Bromomethane Vinyl Chloride Trichlorofluoromethane 1, 1-Dichloroethene trans-1, 2-Dichloroethene Chloroform Chloroethane Methylene Chloride 1, 1-Dichloroethane COMPOUND DATA FILE CONC. FACTOR SCAN SAMPLE

밀

1, 2-Dichlorobenzene

2

1, 2-Dichloroethane

밁

1, 1, 1-Trichloroethane

2

Carbon Tetrachloride

2

Bromodichloromethane

2

1, 4-Dichlorobenzene

S

trans-1, 3-Dichloropropene

밁

1, 2-Dichloropropane

RECEIVED: 09/05/84

Results by Sample Analytical Serv

REPORT

LAB # 84-09-023 Continued From Above

SAMPLE 1D RB-28-3, 180

NAME EPA Method 601/GC Category

FRACTION 03C TEST CODE GC 601 Date & Time Collected 09/04/84

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in__

PAGE 9 RECEIVED: 09/05/84

Analytical Serv REPORT NonReported Work

LAB # 84-09-023

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

DUP 601 DUP 601 DUP 601 01D 02D 03D

PAGE 1 RECEIVED: 09/05/84

LAB # 84-09-020

Analytical Serv REPORT 09/24/84 11:35:28

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CONTACT CONOVER		sed on this report
PREPARED Radian Analytical Services BY 8501 MoPac Blvd P 0 Box 9948 ATTEM ATTEM PHONE (512) 454-4797 CONTACT CONOVER Please send one copy of the report to Toby Walters in Austin		Analytical Serv TEST CODES and NAMES used on this report case ion, ICPES CL IC Chloride IC CO3 A Carbonate I con, ICPES CC 601 EPA Method 601/GC HCO3 A Bicarbonate HCO3 A Bicarbonate Magnesium, ICPES NA E Sodium, ICPES SOJ Fate IC
REPORT Radian TO B1 4 Austin Or Sacramento ATTEN Wayne Pearce CLIENT MCCLELLAN AF COMPANY McClellan AFB FACILITY	WORK ID <u>Reconn Boring</u> TAKEN <u>8/4/84</u> TRANS <u>hand carried</u> TYPE <u>H2O</u> P O. # <u>212-027-16</u> INVOICE <u>under separate cover</u>	SAMPLE IDENTIFICATION O1 RB-29-1, 135-145 O2 RB-29-2, 150-160 CA E CL IC CO3 A FE E GC 601 HC03 A MG E NA E S04 IC

PAGE 2 RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-020

SAMPLE) RB-29-	SAMPLE 1D RB-29-1, 135-145		SAMPLE # 0	1	RACTIONS: A.	B. C. L	0			
				Date & Tim	CO al	Date & Time Collected 09/04/84	04/84		Category	ıry.	
ω	H	25 CL IC	8	CO3 A (1 FE E			1.2	HC03 A 100 MG E	100	AG E	17
	ug/m1		mg/L	mg/L as CaCO	l¤		/m1	mg/L as	Cacoa		ng/m1
N E	82	S04 1C	√0								
	ug/m1		mg/L								

PAGE 3 RECEIVED: 09/05/84

LAB # 84-09-020

Analytical Serv REPORT Results by Sample

TEST CODE GC 601 NAME EPA Method 601/GC lected 09/04/84 Category	ANALYST KS COMPOUNDS DETECTED BY JSG INSTRUMENT A COMPOUNDS DETECTED O	SCAN COMPOUND RESULT	Trichloroethene ND	Dibromochloromethane * ND	1, 1, 2-Trichloroethane * ND	cis-1,3-Dichloropropene * ND	2-Chloroethylvinyl Ether ND	Bromoform ND	1, 1, 2, 2-Tetrachloroethane # ND	Tetrachloroethylene # ND	Chlorobenzene ND	1, 3-Dichlorobenzene ND	1, 2-Dichlorobenzene ND	1, 4-Dichlorobenzene ND				
FRACTION OIC TEST CODE GC 60 Date & Time Collected 09/04/84	DATE INJECTED 09/07/84	DUND RESULT	Chloromethane ND :	Bromomethane ND	Vinyl Chloride ND	Chloroethane ND	Methylene Chloride ND	Trichlorofluoromethane ND (1,1-Dichloroethene ND	1, 1-Dichloroethane ND	Dichloroethene ND	Chloroform ND	1,2-Dichloroethane ND	richloroethane ND	Carbon Tetrachloride ND	Bromodichloromethane ND	1,2-Dichloropropane ND	-
SAMPLE ID RB-29-1, 135-145	DATA FILE A	SCAN COMPOUND			-		Meth	Trichlor	1,1-	1,1-	trans-1,2-Dichlor		1,2-	1, 1, 1-Trichlor	Carbon	Bromod	1, 2-0	

PAGE 4 RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-020 Continued From Above

SAMPLE ID RB-29-1, 135-145

FRACTION OIC TEST CODE GC 601 Date & Time Collected 09/04/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT

*Dibromochloromethane, 1,1,2-trichloroethane and cis-1,3-dichloropropene co-elute. All results reported in $\frac{uq/L}{L}$ unless otherwise specified. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. SCAN = scan number or retention time on chromatogram.

PAGE 5 RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-020

	Category
SAMPLE # 02 FRACTIONS: A, B, C, D	Ime Collected 09/04/
SAMPLE ID RB-29-2, 150-160	

CA E 19 CL_IC 20 CO3 A (1 FE E 1.3 H) NA E 17 504 IC 5.1 NA E 17 504 IC 5.1	SAMPLE	SAMPLE ID RB-29-2, 150-160	2, 150-160		SAMPLE #	당	FRACTIONS	A. B. C.	_			
E 19 CL IC 20 CO3 A (1 FE E mg/L as caco3 E 17 SO4 IC 5.1 mg/L					Date & T.	i Be	Collected	09/04/8	4	Category	ory	
E 17 SO4 IC 5.1 mg/L as CaCO3	CA FI	19	CL IC	8	CO3 A				HC03 A 122 MG E	122	MG E	14
E 17 SO4 IC	 	lm/gu		T/6w	mg/L as Ca(503		ug/ml	mg/L as	CaCO3		1m/60
1	NA E	1	S04 IC	رج 1								
	1	ug/m1	t	mg/L								

RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-020

SAMPLE ID RB-29-2, 150-160

RESULT VERIFIED BY COMPOUNDS DETECTED NAME EPA Method 601/GC Category COMPOUND MCL FRACTION 02C TEST CODE GC 601 Date & Time Collected 09/04/84 ANALYST INSTRUMENT SCAN DATE INJECTED 09/10/84 RESULT COMPOUND DATA FILE CONC. FACTOR SCAN

SS 61

Dibromochloromethane

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Bromomethane

밀

Chloromethane

呈

Vinyl Chloride

2

Chloroethane

Methylene Chloride

윋

Trichloroethene

2

2

1, 1, 2-Trichloroethane

2 cis-1, 3-Dichloropropene

2-Chloroethylvinyl Ether

S

일

Bromoform

0

Trichlorofluoromethane

밁

1, 1-Dichloroethene

윋

1, 1-Dichloroethane

밁

trans-1, 2-Dichloroethene

2 1, 1, 2, 2-Tetrachloroethane

밁 Tetrachloroethylene

2 Chlorobenzene

윋 1, 3-Dichlorobenzene

2

Chloroform

밀

1, 2-Dichloroethane

일

1, 1, 1-Trichloroethane

뮏 1, 2-Dichlorobenzene

9 1, 4-Dichlorobenzene

> 밀 9 Carbon Tetrachloride Bromodich loromethane

일 1, 2-Dichloropropane

밀 trans-1, 3-Dichloropropene

PAGE 7 RECEIVED: 09/05/84

Analytical Serv REPORT Results by Sample

LAB # 84-09-020 Continued From Above

SAMPLE ID RB-29-2, 150-160

FRACTION O2C TEST CODE GC 601
Date & Time Collected 09/04/84

NAME EPA Method 601/GC Category

NOTES AND DEFINITIONS FOR THIS REPORT.

*Dibromochloromethane, 1,1,2-trichloroathane and cis-1,3-dichloropropene co-elute. ND = not detected at EPA detection limit method 601, (Federal Register, 12/3/79). #1, 1, 2, 2-tetrachloroethane and tetrachloroethylene co-elute. ug/L unless otherwise specified. SCAN = scan number or retention time on chromatogram. All results reported in

PAGE 8 RECEIVED: 09/05/84

Analytical Serv REPORT NonReported Work

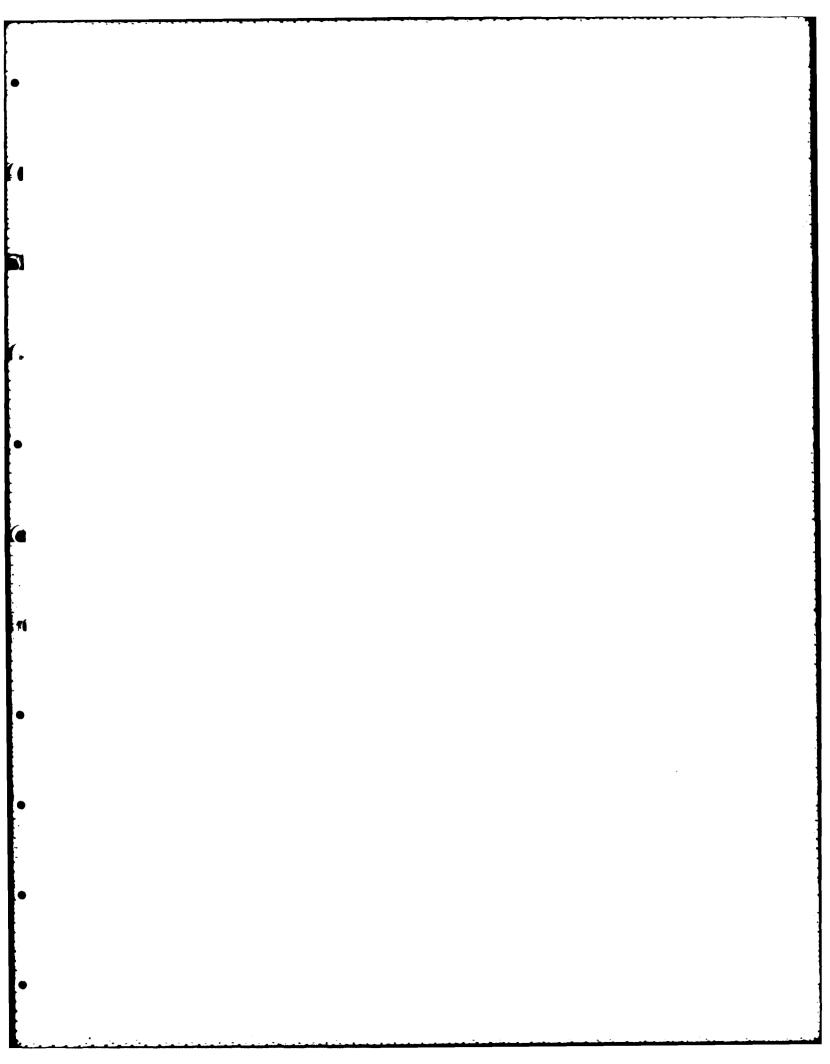
LAB # 84-09-020

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE DUP601 DUP601 01D 02D

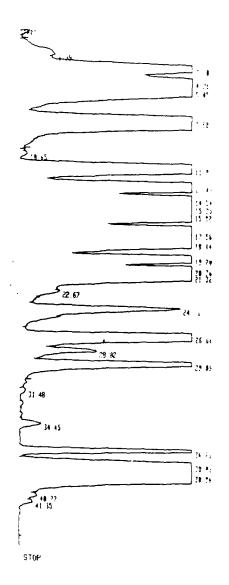


APPENDIX 5-F

Raw Laboratory Data for Selected Water Samples
(Volatile Organic Analysis - EPA 601)



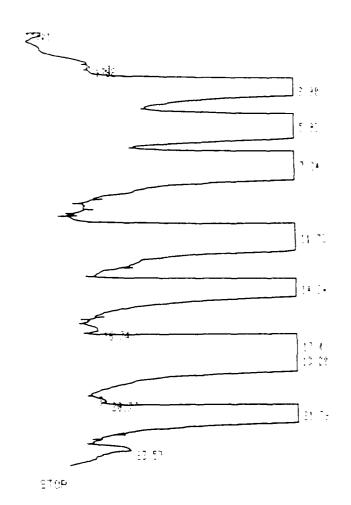
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EPA 601 Calibration Standard 10 ppb

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7 68	2 45146+47	AB	1 965	5.56
10 65	88 99 8	VP	9 385	13 A 24
11 87	1 74975+87	₽¥	3 258	1 1951
13 43	1 94038+02	٧V	9 646	3 74H
14 54	1 28378+47	77	9 442	4:78
15 25	5 70248+07	V٧	# 673	15 116
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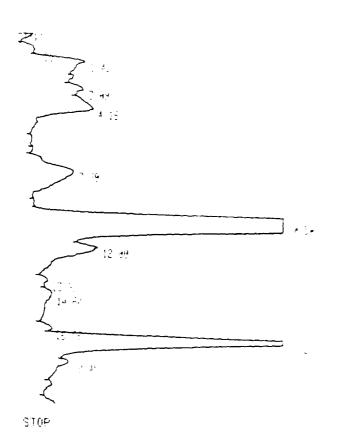


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TOTAL PREAS : 139ME+88 WILL PACIFIE 1 DUBNE+UB A.C. Spike 10 ppb

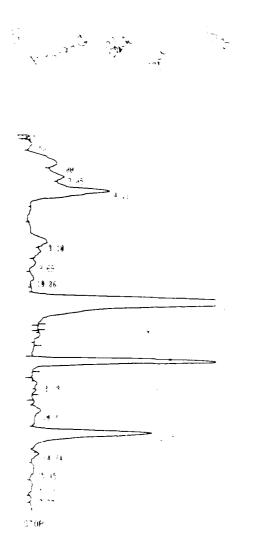
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Second Q.C. Spike 10 ppb

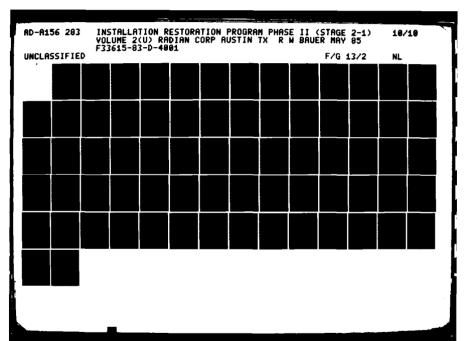
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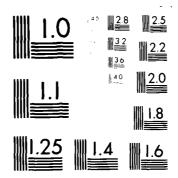
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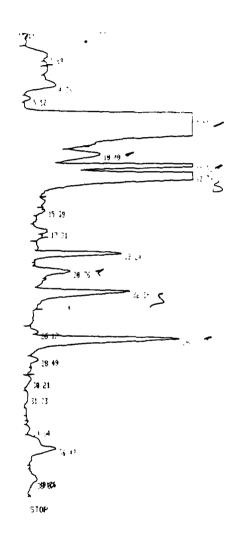
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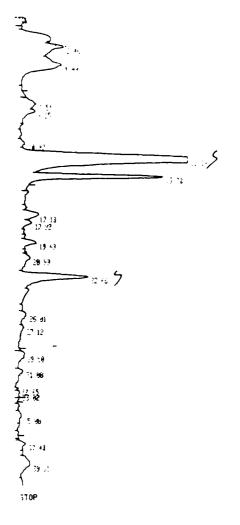




Sample RB-1-1

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Sample RB-1-2

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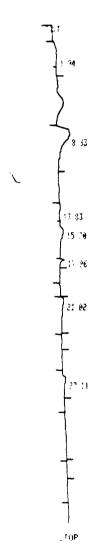
Sample RB-1-3

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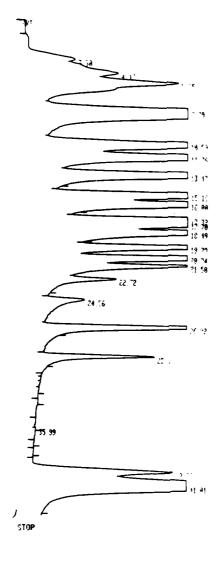


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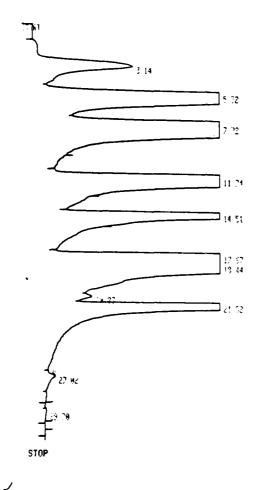


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EPA 601 Calibration Standard 10 ppb

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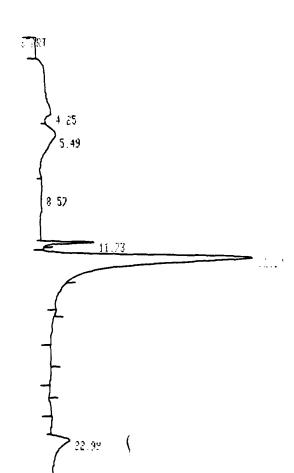


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7 72	5 21936+02	48	9 939	15 150
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14 51	1 59551+07	£.B	9 4/3	5.713
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13 44	6 3417E+97	SHH	0 .39	15 195
29 33	82°°360	TEB	9 297	0.062
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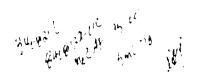


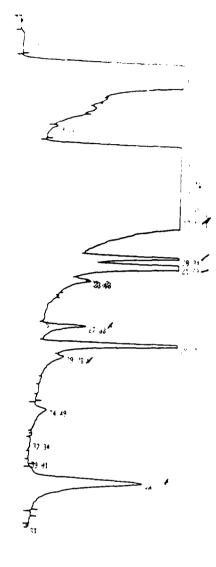
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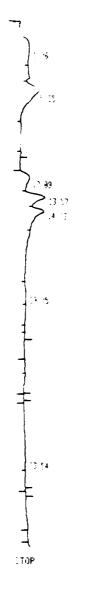




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Sample RB-5-1 (off scale) Budgo 20 M plante 5 ml MM



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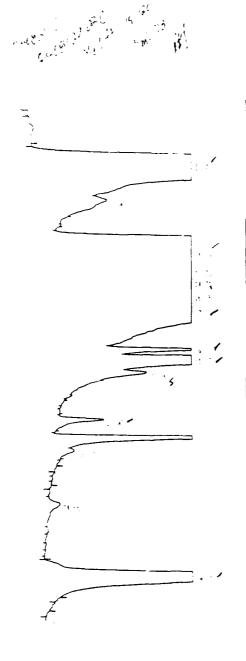
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असी संच ३ १ वटहरूक भाग अहिंग्सिट १ लगावा स्था Sample RB-5-1 1:10 Dilution



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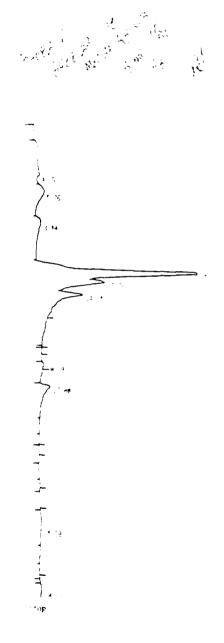
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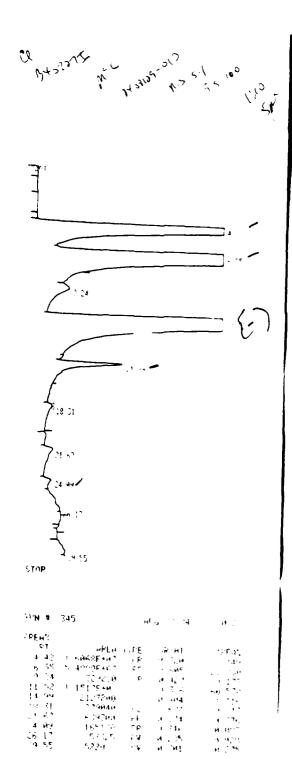
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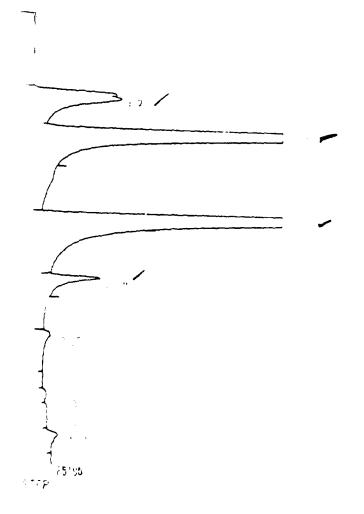


Sample RB-5-1 Second Column Confirmation

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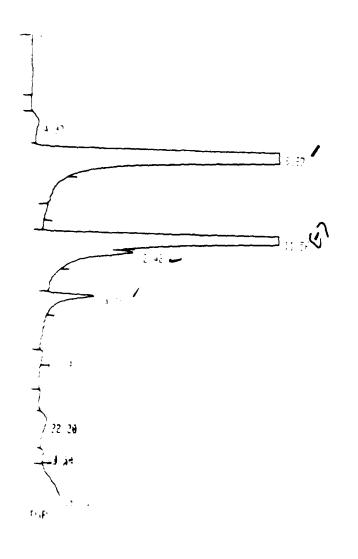


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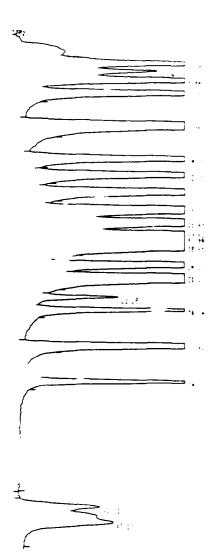


Sample RB-5-3 Second Column Confirmation

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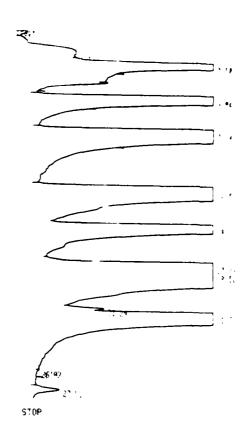


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EPA 601 Calibration Standard 10 ppb

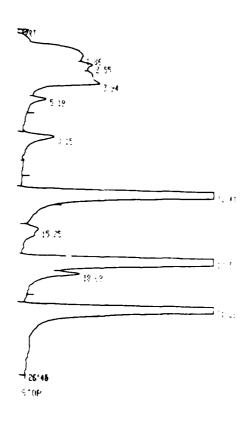
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Q.C. Spike 10 ppb of hisping (My My Ne Ch.



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Second Q.C. Spike 10 ppb

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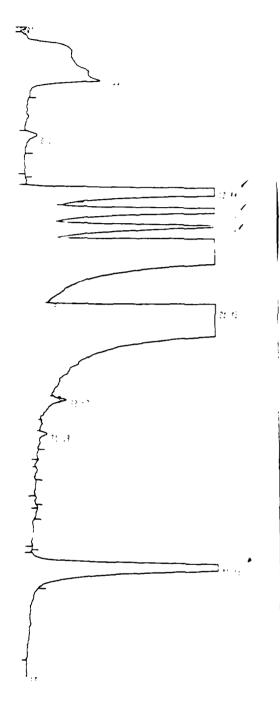


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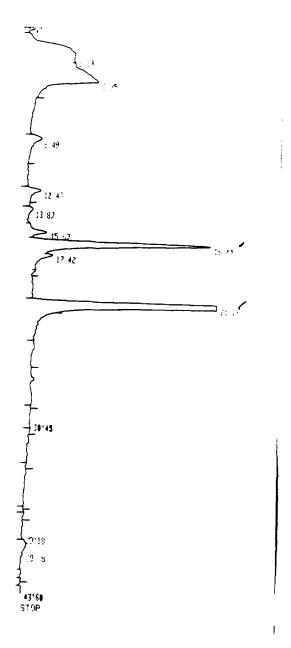
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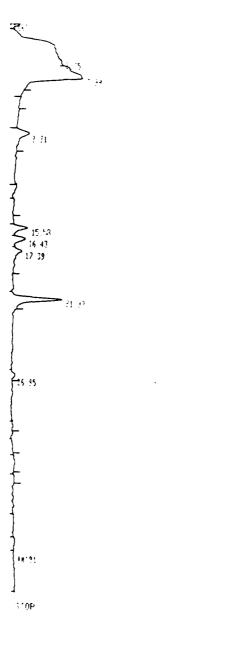
 Sample RB-6-1 (off scale) St 84.2910/4 St. 29.22. 1.20



Sample RB-6-1 1:50 Dilution

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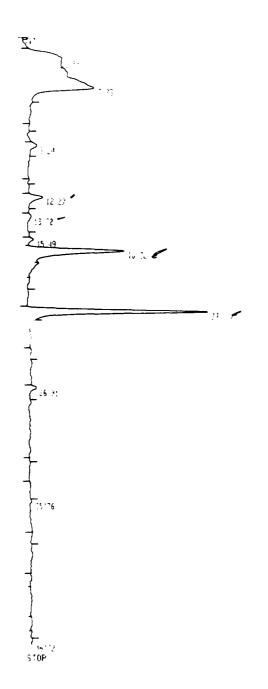
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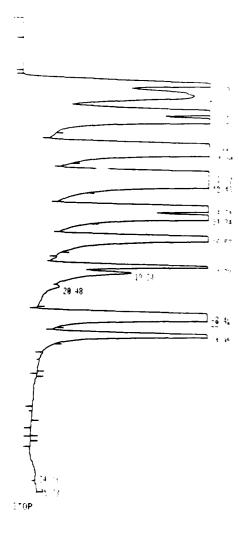
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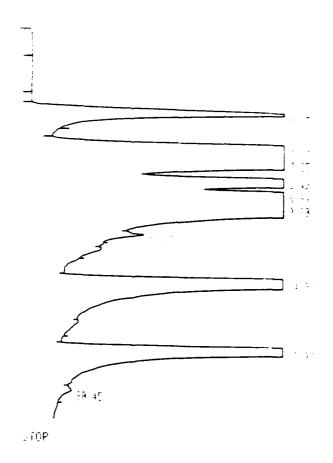


EPA 601 Calibration Standard 10 ppb

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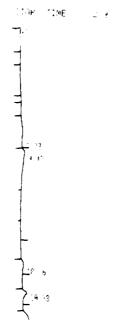
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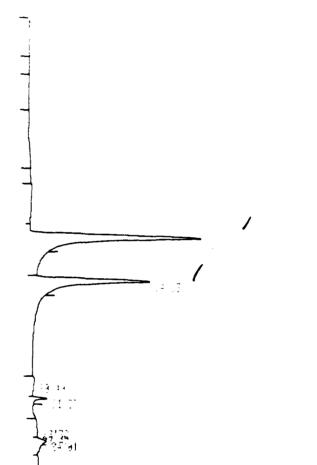
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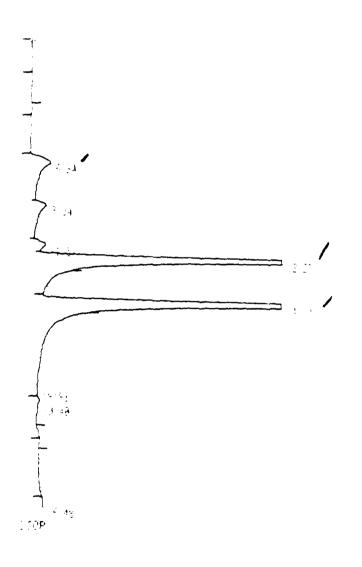
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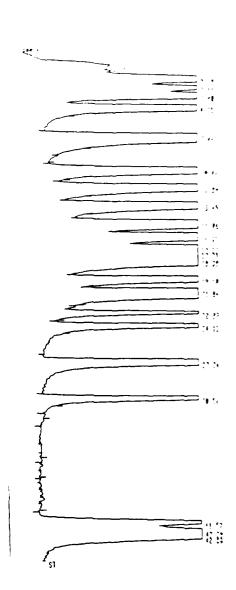
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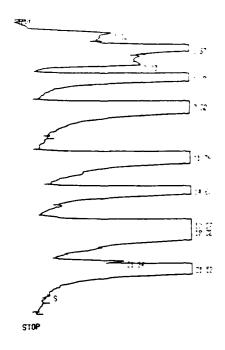
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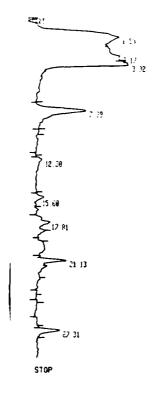
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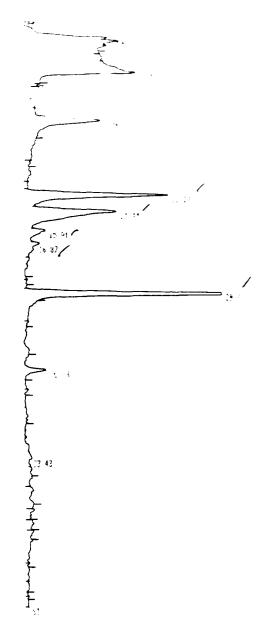
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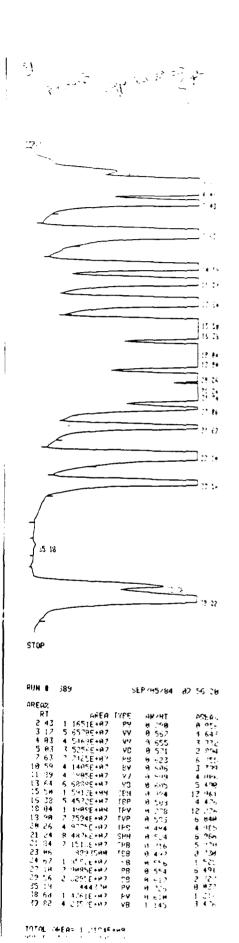
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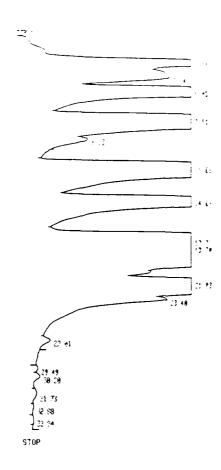
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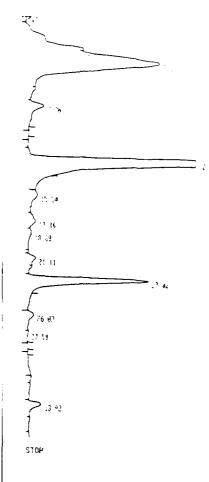
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APPENDIX 6

This appendix provides information regarding Task 6, as discussed in text Section 3.6.

Appendix Contents

There is no Task 6 Appendix requirement at this time. Appendix 6 was listed in order to maintain numeric order with task numbers.

APPENDIX 7

This appendix provides information regarding Task 7, as discussed in text Section 3.7.

Appendix Contents

7-A Suggested Monitor Well Drilling and Installation Procedures



SUGGESTED MONITOR WELL DRILLING AND INSTALLATION PROCEDURES

A series of monitor wells are planned to better define hydrogeologic conditions and the nature and extent of ground-water contamination in areas surrounding McClellan AFB. Suggested measures for the installation of the monitor wells are detailed in the following sections.

Supervision of Drawing Activities

All well installation activities should be conducted under the direct supervision of a geologist or geotechnical engineer. Representative geologic samples should be collected, containerized, described, and logged at five-foot intervals during well drilling operations. Samples should also be collected and where significant changes are noted during drilling. The geologist supervising the well installation effort should also ensure that safety procedures and new construction/development specifications described in the Work Plan are adhered to by the drilling contractor.

DRILLING METHODOLOGY

Monitor well drilling should be conducted by two methods. The hollow stem auger (HSA) method should be used in areas where the maximum depth of drilling is less than about 120 feet as conditions allow. The HSA method should be used for the emplacement of 4-inch diameter monitor wells in the first significant waterbearing zone. The direct air rotary with casing drive method should be used to drill wells in excess of 120 feet. Suggested procedures for monitor well drilling are detailed below.

Hollow-Stem Auger

As discussed in Section 7.0, the hollow-stem auger method offers a relatively rapid, efficient drilling method that will result in the timely installation of shallow monitor wells. In areas where the depth to water is

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less than about 100 feet, the hollow stem auger method provides an accurate means for determining the characteristics and thickness of the geologic units encountered during drilling. Drilling should be accomplished without the introduction of drilling fluids, thereby permitting the precise determination of water-bearing strata. The acquisition of samples through the hollow center of the augers with a split-spoon or Shelby tube is a rapid and reliable means of obtaining geologic samples.

For emplacement of 4-inch diameter monitor wells, the use of 12-inch outside diameter, 8-inch inside diameter hollow-stem augers is required. The use of a 12-inch diameter hollow stem auger to depths up to 120 feet will require the use of piloting techniques. Piloting will consist of using a 6 or 8 inch hollow-stem auger to create a pilot hole for the 12-inch augers. Sampling operations will be conducted during piloting operations.

Upon drilling to total depth and diameter, the well casing and completion materials should be emplaced through the hollow stem of the auger flights. The use of 12-inch diameter hollow-stem augers for reaming operations will require that a "knock-out" plug be placed in the down-hole end of the 12-inch drill string to prevent cuttings from entering the hollow-stem. Immediately prior to the emplacement of the casing and seven within the drill string, the hollow-stem should be filled with "clean" or chemically compatible water to at least the elevation of the water table. Placement of water within the hollow-stem will prevent the possible washing in of materials into the augers at the time the knock-out or auger plug is removed. Materials washed into the hollow-stem of the augers may cause the stem to be clogged or the well casing and screen to become locked.

Completion materials such as sand, bentonite and grout should be emplaced through the hollow stem of the augers during withdrawal to promote vertical continuity of the completion. Care should taken to ensure that the casing and screen do not become "sand wedged" during the withdrawal of the augers.

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All down-hole drilling tools should be thoroughly cleaned using a high-temperature, high-pressure cleaner to prevent cross-contamination between well borings. As a further measure to prevent possible cross-contamination, all soil sampling equipment (A-rods, Shelby tube, and split spoon) should be thoroughly cleaned between borings. The Shelby tube and/or split spoon should be washed and rinsed between samples.

The method and types of fluids employed for cleaning the Shelby tube and/or split spoon between samples will be dependent upon the type of chemical analysis (if any) performed for the soil samples. If organic analyses are required, reagent-grade solvents, such as acetone or methanol alcohol may be required for cleaning operations. If no analyses are to be performed, then only water will be required for washing sampling devices.

No petroleum or lead-based thread compounds should be employed on down-hole tools if organic or trace metal analyses are to be performed. If lubricants are necessary; vegetable oil or a fluorocarbon-based lubricant may be used if they are chemically discernible from parameters to be analyzed.

Care should be taken to prevent the introduction of drill rig fluids, such as lubricating and hydraulic oil, into the well bore-hole. A small earthen berm should be constructed around the bore-hole while it is open to prevent possible entry of surface contaminants during run-off events.

Direct Air-Rotary Method with Casing Drive

Depending on actual conditions encountered in the field, monitor wells deeper than approximately 120 feet should be drilled using air-rotary with casing drive methods. As discussed in Section 7.0, the air rotary with casing drive methods consists of essentially a normal rotary method except that compressed air is employed as the drilling fluid. In order to allow for return of representative cuttings, prevent bore-hole collapse during drilling, and restrict or eliminate vertical movement of ground water within the boring, steel casing should be advanced as the bit proceeds. Normally,

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the casing is slightly larger in diameter than the drill bit to allow for a tight formation-to-casing contact. Wobble bits or expanding bits may be employed to create a boring diameter larger than of the driven casing. A standard rotary bit should be used to ensure the highest practical formation-to-casing contact. A wobble or expanding bit may be required if the driving and/or extraction of the temporary casing becomes difficult when a standard bit is used.

As discussed in Section 7.0, the use of air rotary with casing drive promotes the integrity of the bore-hole and should prevent/reduce possible cross-contamination of aquifer subunits during drilling. The air-rotary method yields continuous and accurate geologic and water quality samples with depth. The method also provides for good well completion control.

All air rotary operations should be conducted without the use of liquids where possible. Occasionally, water and/or possibly foam may be required to be injected into the air stream for bore-hole/casing cleanout. Such a requirement is likely to occur where adhesive clay materials are encountered. If water and/or foam is required, care should be taken to ensure that only clean, potable water and chemically compatible foams are introduced into the bore-hole. Petroleum and metal-based thread compounds should not be used for lubricating down-hole tool joints/threads.

Sampling and decontamination operations used for air-rotary drilling operations should essentially be the same as those employed for augering. Samples collected from the cuttings stream, while being geologically representative, will be stripped of some, if not all, volatile hydrocarbons (if present in the strata) as they are produced from the discharge port. If required, representative lithologic samples may be obtained for volatile compounds by tripping out the drillstem and bit and inserting down-hole sampling tools. Such operations will require relatively large amounts of time where samples are to be retrieved at significant depths. The presence of volatile organic organic compounds in deeper, saturated zones may be determined as drilling proceeds by periodically tripping a small-diameter

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pump into the bore-hole to purge the bore-hole (after sufficient recovery) to obtain a sample. If a properly sized pump is used, the pump may be deployed with the drillstem and bit in the borehole.

As saturated zones are encountered during drilling, grab samples of ground water will be collected for possible analysis. All cuttings, water samples and downhole drilling tools should be monitored or "sniffed" using an organic vapor analyzer/detector (OVA) to detect the presence of volatile organic compounds during drilling.

Regardless of the drilling method to be employed, the general area of each well boring should be scanned using a buried metal/pipe locater (radio detection) to identify possible near-surface obstructions/hazards before drilling begins. All monitor well locations should be cleared with property owners, public and private agencies and public utilities.

Well Completions

Following the completion of drilling activities at each well, a well screen will be positioned at appropriate monitoring interval(s). Screened interval(s) should be deep enough to accommodate seasonal variations in water levels within the well, where possible. For shallow and deep wells, the casing and screen should be 4-inches in diameter.

The monitor wells should be completed using stainless-steel casing (for the wetted zone only) and screen. Stainless-steel screen and casing present the best choice for durability and dependability. The screen slot size will be compatible with formation and sand pack materials as discussed in Section 7.0. All casing/screen connectings should be flush threaded. No thread compounds or glues should be applied to the casing/screen joints.



The screen section and stainless casing in the saturated zone will be joined to Schedule 40 PVC, flush-threaded casing extending through the unsaturated zone to land surface. No glues, solvents, or thread compounds should be employed for joining the casing/screen sections. Prior to installation, casing and screen sections should be thoroughly washed to remove possible contaminants with chemically compatible water using a high-temperature high-pressure sprayer.

After the casing and screen have been installed at each well, a sand pack will be emplaced between the screen and the boring wall. The pack should consist of washed and bagged Monterey sand or equivalent. The sand pack should extend to at least two feet above the top of the screened interval. The grain-size distribution of the sand pack should be compatible with the screen slot-size and the formation materials.

In the case of auger drilling, the sand pack should be poured into place through the hollow stem of the augers as they are pulled. The airrotary borings, the sand pack material should be tremied into place as the temporary steel casing is withdrawn.

Granulated bentonite should be tremied or poured above the sand pack to a minimum thickness of two feet to provide a dependable seal. The bentonite seal should be wetted in the borehole using potable water to ensure that the seal is matured before cementing operations commence.

Bentonite cement grout should be tremied from above the top of the bentonite seal to land surface. No more than a ten percent gel mixture should be used. The emplacement of the bentonite and grout should occur as the casing/augers are withdrawn to ensure integrity of the completion.

Surface Completions

After the annulus of each well has been grouted to land surface, surface completions for the wells should be constructed. The type of surface

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completion (i.e., above- or below-grade) should be compatible with local land use. The surface completion for each well should provide a reasonable amount of protection against potential vandalism or accidental destruction by vehicles. The surface completion should also provide for an adequate casing seal to ensure that entry of surface contaminants does not occur.

WELL DEVELOPMENT

Following the completion of well construction activities, each monitor well should be thoroughly developed. Development operations are necessary to ensure that the sand pack, screen, and well bore are purged of possible drilling residuals and that the well attains a suitable efficiency.

Development operations should be conducted using a submersible pump or bailer. Non-wetted sections of the well bore should be swabbed and rinsed during development operations. Development operations at each well should be considered complete when the discharge becomes clear or when the operations are considered to be complete by the supervising geologist.

Water displaced from each well during development operations should be containerized in a movable steel tank. Prior to disposal, the water should be chemically characterized so that proper disposal methods are employed. Based on the type and level of contamination expected, it is anticipated that development water will be discharged to the McClellan AFB industrial wastewater treatment plant for treatment/disposal.

SITE CLEAN UP AND CUTTINGS CONTROL

During drilling operations, potentially contaminated cuttings and water will be displaced. All cuttings and water produced during drilling should temporarily be stored in 55-gallon steel drums or in bowsers. Cuttings should be monitored using an organic vapor analyzer to determine the presence of possible volatile contaminants. Based on levels of volatile contaminants in the cuttings (as specified by concerned regulatory agencies

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and standards), an appropriate method of disposal should be selected. All well sites should be cleaned up following the completion of well installations to ensure that the appearance of the site is returned to a proper condition.



This appendix provides information regarding Task 8, as discussed in text Section 3.8.

Appendix Contents

There is no Task 8 appendix requirement at this time. Appendix 8 was listed to maintain numeric order with task numbers.

This appendix provides information regarding Task 9, as discussed in text Section 3.9.

Appendix Contents

9-A Comparison of Equipment and Costs - Portable vs.
Dedicated Well Sampling Systems

TASK 9 APPENDIX

Comparison of Equipment and Costs--Portable vs. Dedicated Systems

I. Original Equipment Costs (Capital Costs)

Portable System

Bennett Model 180-125 Repair Kit Teflon Bailer 125' Stainless Steel Cable Subtotal	\$3,231.25 53.75 120.00 125.00 3,530.00 822.49 \$4,352.49
Cubbana 1	822.49
PADLOLSI	
G&A @23.3%	\$4,352.49
Total Cost	•
Dedicated System	
Per Well	
Well Wizard Model T01200, Pump, Teflon/Stainless Steel 100' Tubing @ \$2.50/ft. Cap Assy	395.00 250.00 28.00
ş	673.00
x 50 wells	33,650.00
Per System	
Controller	1,695.00
Total Costs	35,345.00
G&A @23.3%	8,235,38
\$	43,580.38

II. Replacement/Repair Costs

Portable System--5 year intervals

Factory Repair of Pump \$ 148.75
Replacement Tubing-- 900.00
125' @ \$7.20/ft \$ 1,048.75

Discounting to present value using single payment present worth factor, 10% rate

5 year	0.6209		
10	.3855		
15	.2394		
20	.1486		
25	.0923		
	$1.4867 \times 1,048.75$	=	1,559.18

Dedicated System

Replacement of Pump and Tubing at 10 year intervals @ \$673 each

Discounting to prevent value

10 year 0.3855 20 year 0.1486 .5341 x 673.00 = 359.45

x 50 wells =

Total dedicated system repair costs \$17,972.50

III. Total Equipment Costs

	Portable	Dedicated
Capital Costs	\$ 4,352.49	\$43,580.38
Repair Costs	1,559.18	17,972.50
TOTAL	\$ 5,911.67	\$61,552.88

IV. Sampling Labor Costs

	Portable		Dedicated	
	Air Force Labor	Contract Labor	Air Force Labor	Contract Labor
First year, quar- \$ terly, 50 wells (200 samples) no discount)	6,100.00 (15.25/hr x 2 hr x 200)	\$10,800.00 \$ (27.00 x 2 x 200)		\$ 5,400.00 (27.00 x 200)
Second year, 50 wells (200 samples), discounted to present value (x 0.9091)	5,545.51 (6100 x 0.9091)	9,818.28 (10,000 x 0.9091)	2,772.76 (3050 x 0.9091)	4,909.14 (5400 x 0.0901)
Third through 30th year (28 years) (50 samples) discounted to present value, using	1,525.00 (15.25 x 2 x 50)	2,700.00 (27.00 x 2 x 50)	762.50 (15.25 x 50)	1,350.00 (27.00 x 50)
present worth				
	12,903.02	22,844.70	6,451.51	11,422.35
Total Labor Costs \$	24,548.53	\$43,462.98 \$	12,274.27	\$21,731.49

V. Total System Costs

	Portable		Dedicated		
	Air Force Labor	Contract Labor	Air Force Labor	Contract Labor	
Equipment	\$ 5,911.67	\$ 5,911.67	\$61,552.88	\$61.522.88	
Labor	24,548.53	43,462.98	12,274,27	21,731,49	
Total	\$30,460.20	\$49,374.65	\$73,827.15	\$83,284.37	
(\$)					
					
adding one more hour of labor per sample for	12,274.27	21,731.49			
portable option	\$42,734.47	\$71,105.66			
reducing dedicated replacement to once per 5 yrs					
$\frac{-0.5341}{-0.2947} \times 673.00$	x 50		<u>-9,916,66</u>	<u>-9.916.66</u>	
			\$63,910.49	\$73.367.71	



This appendix provides information regarding Task 10, as discussed in text Section 3.10.

Appendix Contents

There is no Task 10 Appendix requirement at this time. Appendix 10 was listed to maintain numeric order with task numbers.



This appendix provides information regarding Task 11, as discussed in text Section 3.11.

Appendix Contents

There is no Task 11 Appendix requirement at this time. Appendix 11 was listed to maintain numeric order with task numbers.



This appendix provides information regarding Task 12, as discussed in text Section 3.12.

Appendix Contents

12-A	General	Description	of	Ground-Water
	Methods			

- 12-B Discussion of "TRANS" Model
- 12-C Discussion of "USGS-MOC" Model



APPENDIX 12-A

General Description of Ground-Water Modeling Methods

Ground-water processes, such as advection and contaminant transport, are normally highly complex phenomena. In order for an investigator to better understand and/or predict the behavior of ground-water systems, a system model can be constructed. A ground-water model is a simplification of a system such that the overall behavior of the model is representative of the system of study. The level of sophistication or detail employed by the model is dependent on the nature of the system to be modeled, the extent and reliability of available data, and most importantly, the objectives of the modeling effort.

Ground-water modeling methods range in complexity from system conceptualizations to numerical codes which solve or approximate equations describing subsurface processes. Major categories for ground-water models include the following:

- Conceptual;
- Analog;
- Analytical or mathematical;
- Numerical.

Conceptual ground-water models consist of generalizations and conclusions with respect to the nature and behavior of ground-water systems. They are normally based on available data and scientific knowledge/judgement. The conceptual model is useful for general evaluation of hydrogeologic systems. Conceptual models are not usually suited towards predictive analysis of transient systems.

Analog models are generally described as physical systems whose behavior mimics or parallels that of a ground-water system. Physical systems which have been used to model ground-water phenomena include: resist-ance-capacitance networks, elastic membranes, Hele-Shaw or parallel-plate analogs, conductive liquids/solids, tanks etc. A general discussion of analog models is included in Davis and DeWiest, 1966.

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Analog models are usually logistically difficult to implement and inflexible. Furthermore, most analog models are not well suited for modeling the temporal and spacial distribution of solutes in ground water. Because of significant developments in recent years in digital computers, the use of analog models has generally given way to analytical and numerical models.

Analytical or mathematical models consist of simplified mathematical solutions to the governing equations of ground-water. Analytical models can be used to predict processes in ground-water systems where the system and process of study can justifiably be simplified. Analytical models are not well suited the evaluation of systems which vary spacially and/or temporally, or that incorporate multiple, interrelated processes.

Numerical models are computer codes or numerical schemes implemented for the solution or approximation of governing equations describing physical processes in ground water systems. Methods for the solution of governing equations vary between groups of models and include finite-element, finite-difference and stochastic methods. Normally a mesh or grid is established for a numerical model whereby the characteristic features of a ground-water system are represented. Numerical models are generally better suited the representation of complex systems which vary spacially and/or temporally than the modeling methods described earlier.

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APPENDIX 12-B

Discussion of "TRANS" Model

TRANS (Prickett et al., 1981) is a recently released mass-transport code for simulating mass-transport in ground-water systems. The finite-difference formulation's used by this model for developing ground-water flow solutions. Solute transport is simulated using the particle-in-cell technique for convection processes. The random-walk method is used for simulating dispersion effects. The code also accounts for retardation caused by chemical reactions between the geologic matrix and the solute. TRANS is capable of simulating one- or two-dimensional non-steady/steady-state flow in heterogenous aquifers. The code can also be used for simulating unconfined, confined, or leaky aquifers.

TRANS has gained wide acceptance among ground-water modeling professionals. Professional short-courses on the application and usage of TRANS are conducted periodically.

Test case and application simultions conducted by the code authors and its users have shown TRANS to be capable of producing reasonably accurate simulations using modern numerical techniques. The source code is written in FORTRAN IV and contains approximately 1700 program lines.



APPENDIX 12-C

Discussion of "USGS-MOC" Model

USGS-MOC (Konikow and Bredehoeft, 1978) is a state-of-the-art mass-transport code which can be applied to a large variety of ground-water modeling problems (Kincaid et al, 1984). It can be implemented for one- or two-dimensional anisotropic, non-homogeneous systems involving transient or steady-state flow. The modeling code assumes that gradients of fluid density, viscosity, and temperature do not affect the velocity distribution. It also assumes that significant temporal variation in the saturated thickness of the ground-water system does not occur.

USGS-MOC uses an alternating-direction implicit procedure for solving the finite-difference approximation of the ground-water flow equation. The code couples the ground-water flow solution to the solute-transport solution. The method of characteristics is used to solve the solute-transport equation. The solute-transport portion of the code utilizes a particle-tracking procedure to represent convective transport. A two-step explicit procedure is used to solve a finite-difference equation describing the effects of hydrodynamic dispersion, fluid sources and sinks, and divergence of velocity. The code assumes that the solute is non-reactive.

USGS-MOC has gained wide acceptance among ground-water modeling professionals for mass-transport modeling applications. The Environmental Protection Agency reportedly uses a version of USGS-MOC for the evaluation of waste sites (Kincaid et al., 1984).

Test cases and application simulations conducted by the code authors and its users have shown USGS-MOC to be capable of producing reasonably accurate mass-transport simulations. The source code is written in FORTRAN IV and contains approximately 2000 lines of code.



This appendix provides information regarding Task 13, as discussed in text Section 3.13.

Appendix Contents

There is no Task 13 Appendix requirement at this time. Appendix 13 was listed to maintain numeric order with task numbers.



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